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Mauna Loa, a handsome 56-footer owned by Mrs. Arthur C. James, of Newport, R. I. This day cruiser was built by Lawley after designs by P. Bezanson, and is powered with two six-cylinder Van Blercks

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November, 1916

**MOTOR
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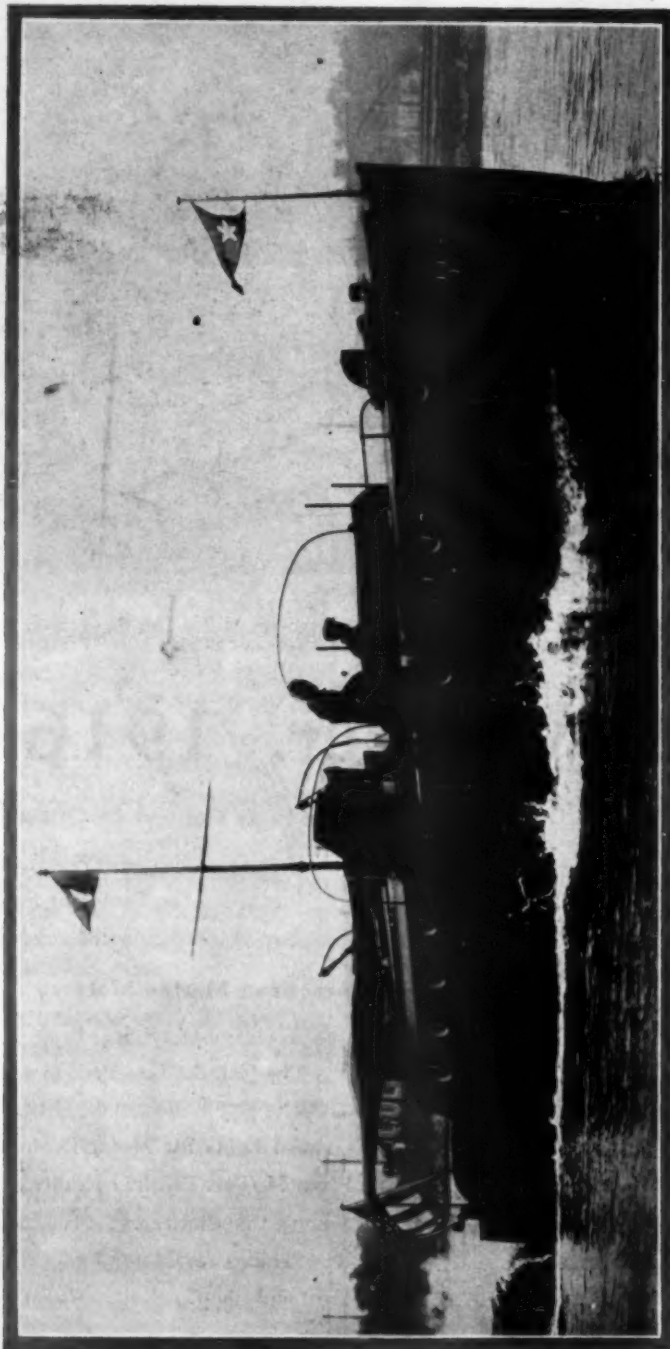
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THE BOAT THAT DID MOST TO SHOW THE ADVANTAGES AND USEFULNESS OF MOTOR CRUISERS IN NAVAL WARFARE



The "SUNBEAM II," Robert B. Roosevelt, owner

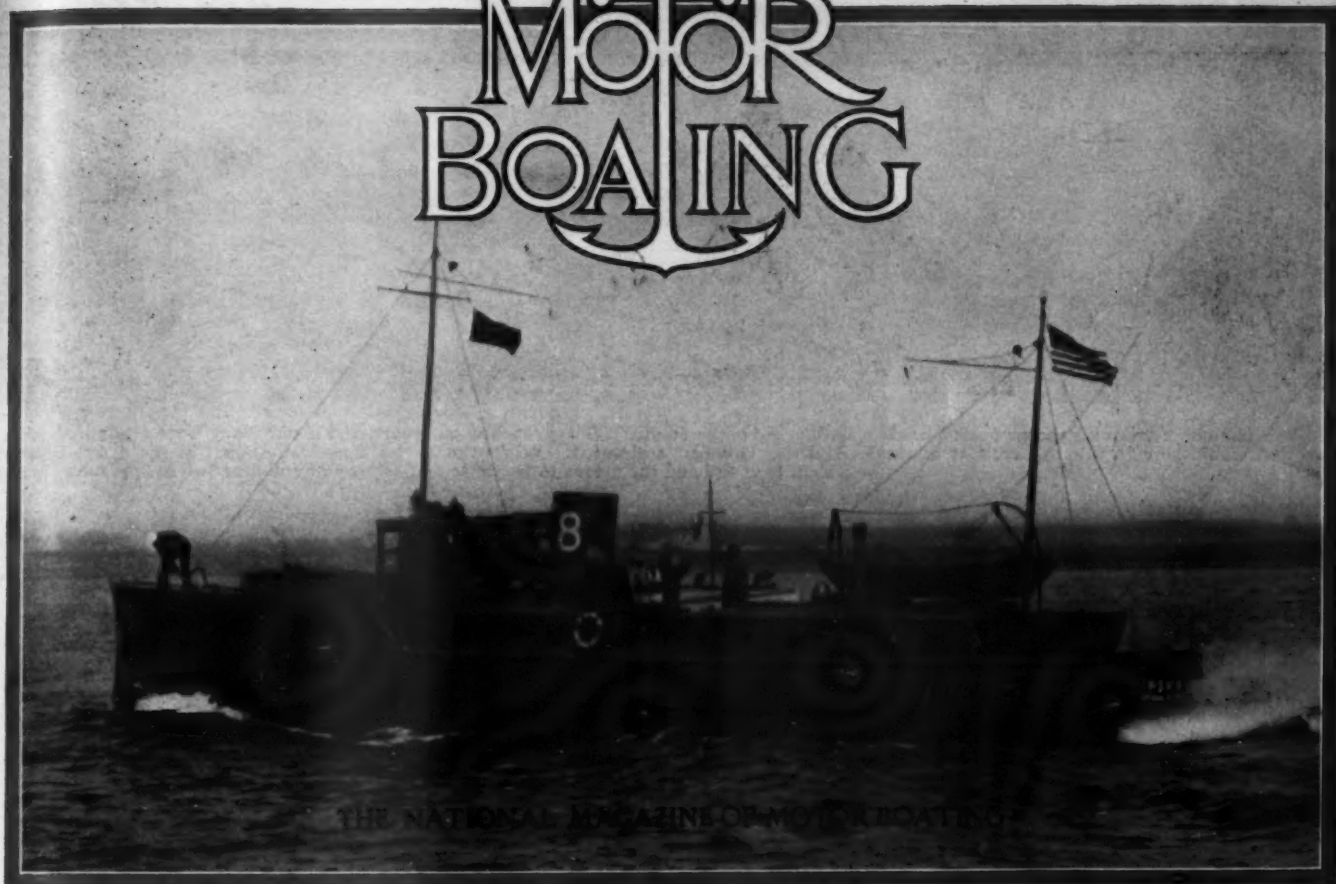
The common sense, medium speed cruiser which won first honors and made a remarkable performance with an amateur crew in the manoeuvres of the battleships in connection with the Naval Training Cruise. Another proof of our common sense "Speedway" boats, versus extreme speed, unstableness, cramped deck and cabin quarters. It is not our purpose to guarantee a "burst of speed"—"Speedway" boats always win in service.

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WRITE FOR DETAILS ON OUR NEW SCOUT CRUISER DESIGNS.

MOTOR BOATING



Harold Vanderbilt's Patrol Squadron boat built along lines approved by the Navy Department. She took part in the recent maneuvers

The Relation Of Motor Boats for National Defense ★ ★ *By Hon. Franklin D. Roosevelt* ★ ★ *Assistant Secretary of Navy*

IT is particularly gratifying to me that the motor boat owners of this country are showing such an excellent spirit of co-operation with the Navy Department. Last spring I was able to put into effect a plan which I had long had in mind for the utilization for naval defense of the logical material and personnel, existing along our coasts. As a result Congress has authorized the creation of a Naval Reserve on a comprehensive scale, including not only merchant vessels and their crews, but also the large and growing number of motor boats and their owners. The first practical step, somewhat crude in many ways, was taken this summer in holding the motor boat exercises at various points on the Atlantic Coast.

Enough has been done to prove the military value and assured success of the movement, and the response of men who have built or have definitely decided to build boats along lines approved by the Navy has far exceeded my expectations.

It is essential to bear in mind certain fundamental principles. First, the movement is a serious one for the benefit of national defense and must, therefore, be conducted along military lines and under the guidance of naval officers. Secondly, if the Govern-

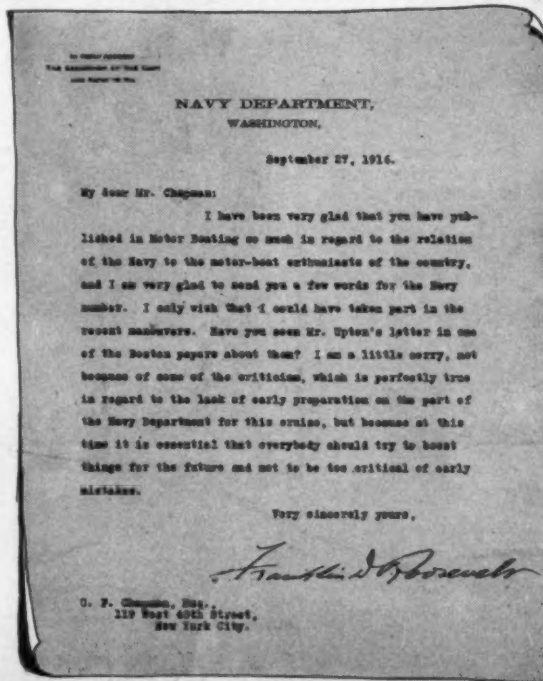
ment is to supervise the organization of this branch of naval defense it must be assured that in time of crisis it will obtain the full results of the work of training. In other words,

if it enrolls boats in the Naval Reserve, it must be able to count on the use of those boats in time of war, and if it instructs the owners and crews of these boats it must be assured of their service.

For a year or two, perhaps, in the beginning it may be good policy to enroll boats which do not come up to the highest standard of efficiency and even to give instruction to civilians who do not expect to give their personal services in war. But as time goes on more and more thoroughly qualified boats will be built and we shall be able to count on a reserve of qualified men to handle them.

In other words, what I want to bring home is that this is serious business; that it is not interesting play, but really does enter into the plans for national defense.

The Navy Department is, I believe, thoroughly interested in the building up of the motor boat defense, and I feel sure that we may expect growing interest and hearty co-operation from the many citizens, not only along the Atlantic Coast, but on the Lakes and the Pacific Coast, who own or are connected with motor boats.



Secretary Roosevelt expresses his approval of MoToR Boating's attitude toward preparedness and calls upon the motor boatmen of the country to co-operate with the Navy Department in forming a motor boat reserve



This is a conundrum for motor boatmen: If a flotilla of hostile submarines approached our coast, and if our Navy were a hundred miles at sea what would happen to our merchant marine? And this is a true statement: When the Patrol Squadron shown in the above illustration is shall have at hand the means to frustrate and destroy any number of enemy submersibles—but

Motor Boats Plan for Submarine Invasion

The Patriotic Work Being Done by Members of the Patrol Squadron to Demonstrate to Our Government Means of Making Our Shores Invulnerable

By Alfred F. Loomis

THE work done in the September mimic war maneuvers by the motor boat fleet in general and the Boston and New York divisions in particular was recounted in the October issue of MoToR Boating, and it now remains to tell the story of the First Patrol Squadron of the Second Naval District, sailing out of Newport. Because much was expected of this squadron of privately owned miniature war vessels, its deeds were allowed to pass with less attention in the daily press than was accorded the brilliant exploits of the "minute boats"—if we may coin the phrase—of Boston Harbor. The latter were out-and-out pleasure craft, in service as though accepted temporarily for an arm of the Navy, much as were the steam yachts of '98 taken over to bridge a deficiency in our sea forces. But the Patrol Squadron was gotten together with the express idea of proving its usefulness to the Navy—or, if not quite that, of pointing the way to a system of coast patrol which will eventually render our shores invulnerable against the attacks of hostile submarines and destroyers.

It would be impossible to praise too highly the spirit of patriotic devotion which prompted the skippers of the Patrol Squadron to build and dedicate their craft to the country's service, and too much credit can hardly be given to A. Loring Swasey, who is one of the prime movers of the organization and whose firm of Swasey, Raymond & Page, designed the units of the fleet. It has been the fashion to speak of this squadron as a plaything of rich men, in spite of the fact that the boats cost less than \$4,000 each—a figure within the means of thousands of men who do not rate themselves wealthy. When it is realized that these vessels fall far short of the ideal as craft suited for pleasure cruising and that some of the owners have no other boats with which to gratify their love of the water, it will stand that it is a patriotism of a high order and not a desire to find a new diver-

other boats to gratify of the wa-be under-it is patriot-high order desire to diver-



Skipper Orson D. Munn, wearing the cap of the First Patrol Squadron. The distinctive uniform adopted by this organization was recommended by Rear Admiral Knight

sion that animates the skippers of the fleet.

The idea back of the squadron came into being in August a year ago, and the co-operation of the Navy Department was sought in or-

der that there might be no working at cross purposes. It was found, however, that the length and speed desired by the Navy would involve rather more of an outlay than the organizers of the squadron cared to swing, and so a compromise was effected for a length of 40 feet and a speed of 25 miles. The baptism of the squadron came in March of this year when Assistant Secretary of the Navy Franklin D. Roosevelt reviewed it in a blinding snowstorm. Not until June, however, did the five units which then comprised the group have their first real work in active service. Starting on June 12 the trim little vessels left Newport for ten days of scouting for submarines, squadron, drill, perfection of organization,



One of the Patrol Squadron vessels in war trim, and Daraga, the mother ship of the squadron. In the September maneuvers Daraga proved that a mother ship is indispensable to the welfare and perfect mobility of an organization of this kind

giving battle to the fleet of a foreign power, multiplied by one hundred or two hundred, we met until then

and all-around hard work. On this occasion Lieut. Commander V. A. Kimberly, U. S. N., and Lieut. W. D. Puleston, U. S. N., aide to Rear Admiral Knight, were in charge, and they put the civilian commanders through a tough course of sprouts.

The whirligig method of surrounding submarines was first practised during this cruise, and the system of shape signals used in September by all the motor boat fleets was introduced at the suggestion of Admiral Knight. The need for the shapes became evident when it was learned that on foggy or hazy days it was impossible to read code flags at a distance—and so successfully were the conical and other shapes employed that all of the submarines were rounded up. The whirligig movement consists in assembling the units of a squadron at high speed to a designated central point and then deploying them to points on an arc of 180 degrees. It resembles somewhat the Army system of establishing outposts.

From June until the last few days in August the units of the First Patrol Squadron did not meet again for formal duty, but they then assembled for a week's drill prior to the regular Navy maneuvers. Again the squadron was



Crow's-nests, added to the P. S. vessels, increased the radius of vision nearly two miles

P. S. 40-footers commencing what is known as the "whirligig" movement for engaging submarines. From a central point the boats deploy over a wide arc

commanded by a naval officer—this time by Lieut. Puleston—and the work of instilling Navy organization and training was carried forward with redoubled vigor. One of the prime purposes of this preliminary cruise was to give the civilians an intimate acquaintance with the water front of the Second Naval District, and this was done by frequent stops at harbors, coves and out-of-the-way places along the shore. Still more valuable was the work of making the crews of the vessels known to the members of the

United States Coast Guard who are stationed in this district, for in time of need it will be part of the defense plan to have the patrol squadrons and the Coast Guard work in conjunction.

Emphasis is laid by the organizers of the First Patrol Squadron on the superior value of extended drill periods as opposed to the afternoon expeditions endorsed by other fleets. They assert that when the men go off on a cruise of a week or more they think and dream nothing but the business of the day, forgetting land interests and allowing nothing to come between them and their goal of attaining perfection in the accomplishment of their duties. That this point is well taken is indicated by a tribute recently paid by Admiral Knight, in which he said that the organization and discipline of the Patrol Squadron was one hundred per cent. perfect.

With the actual opening of the war maneuvers, naval tutelage was withdrawn, and the

(Continued on page 54)

Cruising Along Florida's East Coast

The Possibilities of these Natural and Sheltered Cruising Waters for Winter Motor Boating—
Up-to-Date Data Obtained This Fall which is Not to Be Found in Government Publications

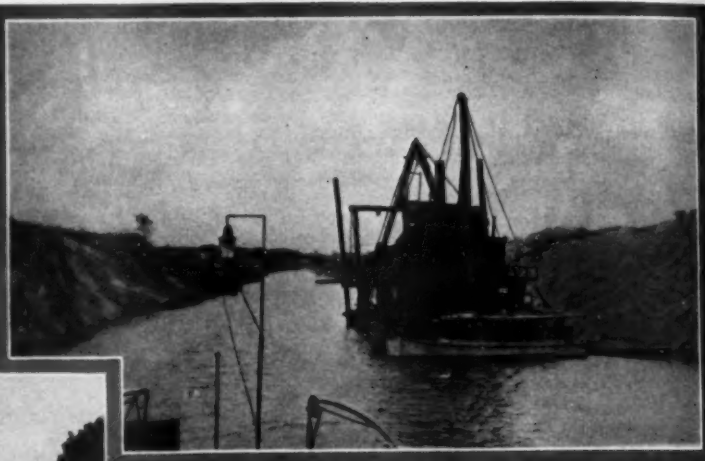
By W. Mack Angas

TO many followers of the sport of motor boating the northern part of the Florida East Coast is merely a stretch of water which has to be traversed in order to reach Miami and the Florida Keys, as the islands lying between Miami and Key West are called. It is perfectly natural that Miami, with her fine fishing grounds, her midwinter regatta and easy access to the keys, should be the Mecca of motor boatmen who spend the winter in Florida, but it is the writer's object to show in this article that the whole of the Florida East Coast is a cruising ground worthy of more than passing notice.

Jacksonville is the natural gateway to the entire peninsula of Florida, whether the State is entered by water or by rail, and it is taken for granted that the southward-bound cruisers will make the twenty-mile trip up the St.

is made, enough gasoline should be taken on in Jacksonville for the entire cruise, as better prices can be had there than at the small towns up the river. Then, too, enough time should be taken to allow for stops at many of the beautiful little towns and villages on the banks. The modern towns are often uninteresting, but the older places are inva-

behind the jetty until a red channel mark is passed. Then swing round this beacon, which



The canal between Matanzas Inlet and the Halifax River. The Government spends large sums of money every year keeping the canals dredged.



A picturesque spot on the west bank of Lake George. In certain months of the year the water here is almost as clear as at the famous Silver Springs on the Ocklawaha.

Johns which is necessary to reach this town.

If time permits it will be well worth one's while to make a cruise up the St. Johns River, either before going further south along the coast, or on the way north in the spring when the trees will have probably put on their new leaves. The St. Johns is beyond doubt the finest single stretch of water in Florida, being much deeper than the Indian River, as well as having many creeks running into it which offer chances for delightful side trips. Some of these side trips can be made in the large cruiser, while others can be negotiated only in a small motor tender or a dink equipped with an outboard motor.

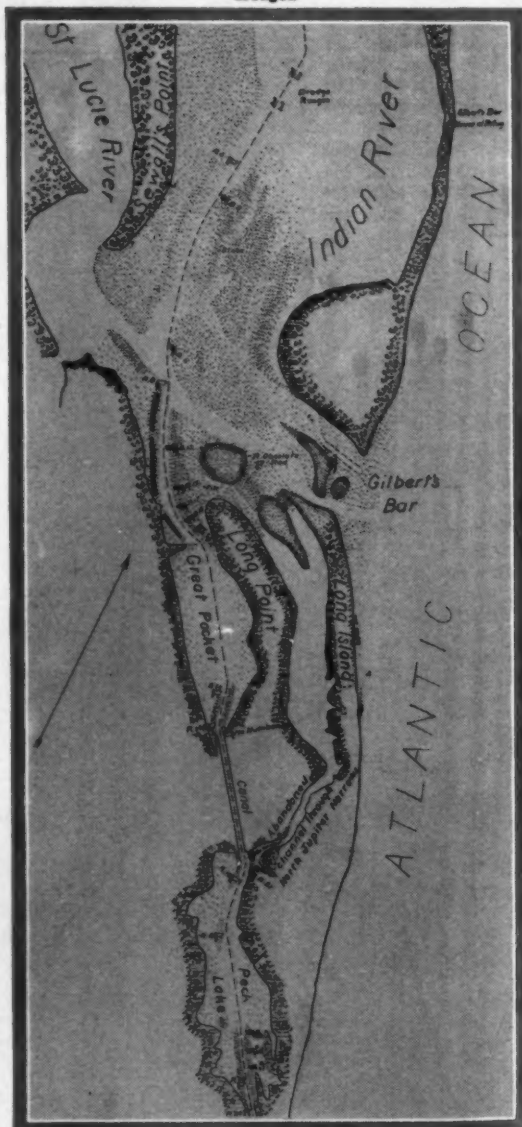
It is impossible in an article of this length to give any adequate idea of the St. Johns, but it may be said that the river takes the form of a chain of lakes for a distance of fifty-six miles above Jacksonville to the town of Palatka. Above Palatka it is narrower for thirty miles or until Little Lake George is reached, and just above this is Big Lake George. Beyond that there is a stretch of sixty miles or more of beautiful, narrow, winding, deep river which leads to Lake Monroe and the town of Sanford, lying on the western shore of that lake. A shoal blocks the entrance to the lake, but if the channel beacons are carefully followed a draft of 4½ feet can be carried to the docks of Sanford.

Above Sanford there is some beautiful scenery, but the trip can only be made when the water is high from heavy rains. If this trip

riably quaint and picturesque.

Having considered the St. Johns briefly it will be as well to turn our attention to the East Coast proper. The first stage of the journey down the coast is that lying between Jacksonville and St. Augustine. An Inside Route Pilot will be found a great help on the run to St. Augustine and, in fact, on the rest of the way down to Miami. Probably a yacht will already have a copy of this Government publication, but, if not, one can be obtained from the H. & W. B. Drew Co. in Jacksonville, who also carry the Government charts and other publications. The large charts indicated on the small ones which accompany the Pilot should also be obtained for the entire trip, as the small scale charts in the Pilot do not show the position of beacons.

In going to St. Augustine from Jax, the St. Johns River is followed until the mouth of Sister Creek is passed on the north bank. A short distance beyond this a stone jetty will be seen projecting up-stream from the south side of the river. Leave the river channel just west of the end of this jetty and steer a course parallel to and



Inside route past Gilbert's Bar. The new channel out to sea, over the bar, is unfinished, and should not be used under any circumstances.

marks the end of a long shoal, and enter the canal, recognizable by the high spoil banks on its sides. Disregard channel marks numbers 1 and 4 as they refer to a disused passage.

When the canal is once entered one may be at times puzzled to know which is the dredged canal and which some shallow creek that it crosses. When this doubt exists the banks should be carefully examined for evidences of spoil left by the dredge, and the leadline made use of. There are three bridges across the canal between the St. Johns and the North River, and the last one of these is used as a toll station for the canal, being kept closed until the toll is paid.

After the southern end of the canal is reached, the North, or Tolomato River is entered and descended for sixteen miles to its junction with the Matanzas River. St. Augustine lies on the Matanzas River about half a mile above this junction. The docking facilities are well described in the Inside Route Pilot, but hardly enough stress is laid on the advantages of the wharves on the Sebastian River which are well protected when north-easterly gales make the anchorage in front of the town unpleasant. St. Augustine itself is one of the most interesting towns in the state of Florida, as it boasts all sorts of ruins, including, of course, the Castle and several "oldest houses in America." The view from the lighthouse on Anastasia Island is well worth the trolley ride over and the climb up the tower, and other attractions to the tourist flourish at Anastasia Beach, a few miles beyond the lighthouse. St. Augustine offers unusually good hotel accommodation to those who would like a few days' rest from the narrow quarters of the boat, and there is plenty to do in and around the town to make such a stay pleasant.

From St. Augustine south the navigation is simple for five miles or so, but from there on

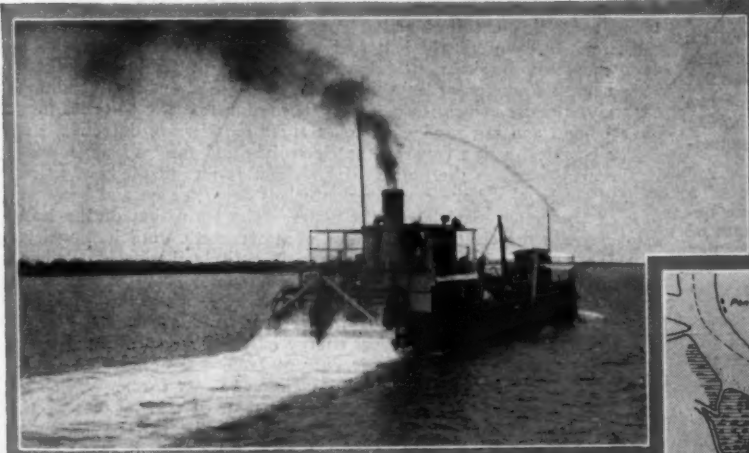
sible attack by water through Matanzas Inlet. The Inlet itself is shallow and should be crossed with great care and at low speed. From the Inlet to the head waters of the Halifax River, near Daytona, there is a long stretch of monotonous and shallow canal. It will be found useless to try to drive a boat fast through this ditch as the water will be merely "kicked out from underneath the boat" and no material increase in speed will be obtained if the engine is run at full speed.

There is a bridge near the southern end of this canal which at one time was not tended, but it now acts as a toll station and yachtsmen passing are saved the trouble of opening it for themselves. A mile or so beyond the bridge there is a place where the channel used to run into the Halifax River, but the dredged cut was so constantly filled with silt by the flow of the river that a canal has been cut which parallels the Halifax along its eastern bank, and the present channel to Ormond lies through this canal.

Both Ormond and Daytona are well described in the Pilot, and the instructions for reaching the dock of the Halifax River Yacht Club need no amendment. A stop

tona by boat or overland by automobile.

From Daytona to Ponce Park the directions given in the Pilot should enable one to avoid all trouble. Mangrove will be seen for the first time on this trip, as the islands north of the Port Orange drawbridge are covered with the growth. Just south of the draw there is a beacon without any direction pointer. It should be left to port. From Ponce Park across Mosquito Inlet the channel is hard to find. There are beacons and buoys to mark the channel, but despite this a great many south-bound yachts have trouble here. A large scale sketched



A stern-wheel motor boat powered with a Kahlenberg engine, on the Indian River

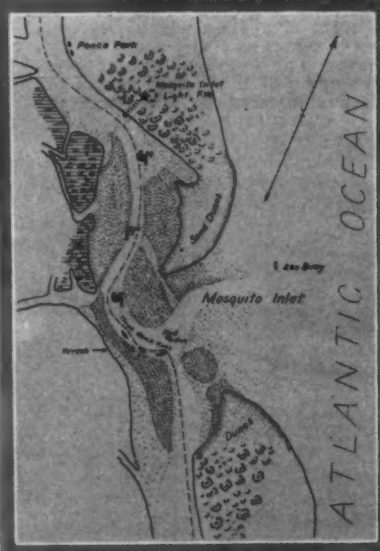
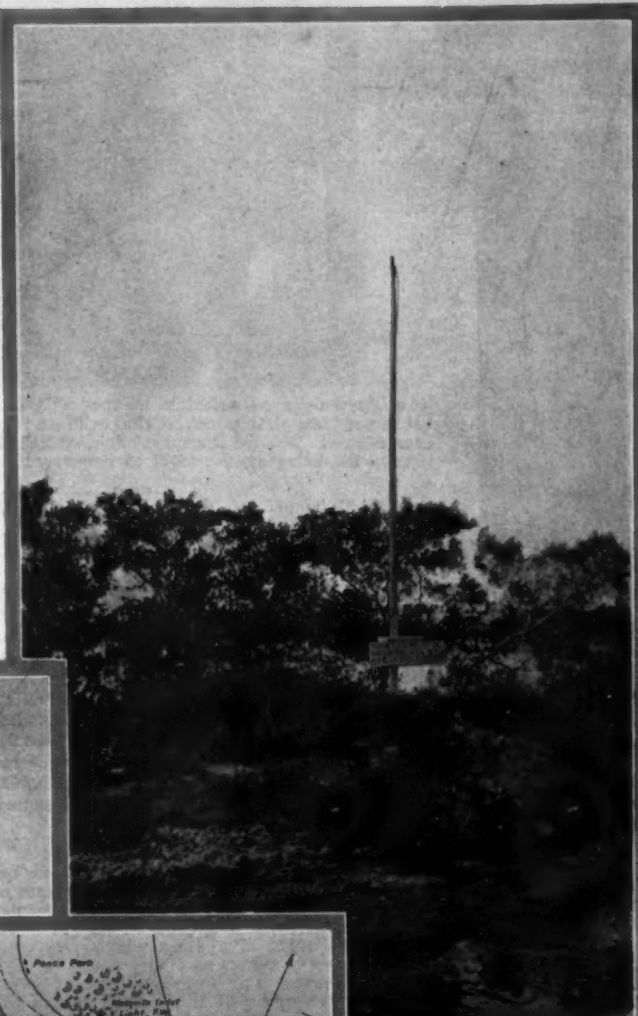
to the canal south of Matanzas River, the channel is crooked and hard to find. It is, however, fairly well marked through the difficult part, and most of the trouble in this part of the passage is caused by failure to notice some beacons which mark an unusual "kink" in the channel. A good pair of field glasses with which to read the numbers of the beacons and thus insure taking them in their proper order will be found invaluable in this and other parts of the inside passage. Where changes in the channel have made extra beacons necessary after the first beacons were put in and numbered, the new ones carry the number of the preceding beacon with a letter added. Thus beacon 22A comes between beacons 22 and 24.

Before Matanzas Inlet is reached an old Spanish fort is passed on the west bank of the river. This ruin is called Fort Matanzas, and was probably used by the Spanish settlers of St. Augustine to guard the city from pos-

sible attack by water through Matanzas Inlet. The Inlet itself is shallow and should be crossed with great care and at low speed. From the Inlet to the head waters of the Halifax River, near Daytona, there is a long stretch of monotonous and shallow canal. It will be found useless to try to drive a boat fast through this ditch as the water will be merely "kicked out from underneath the boat" and no material increase in speed will be obtained if the engine is run at full speed.

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Inside passage across Mosquito Inlet. Do not attempt to pass out over the bar without a pilot

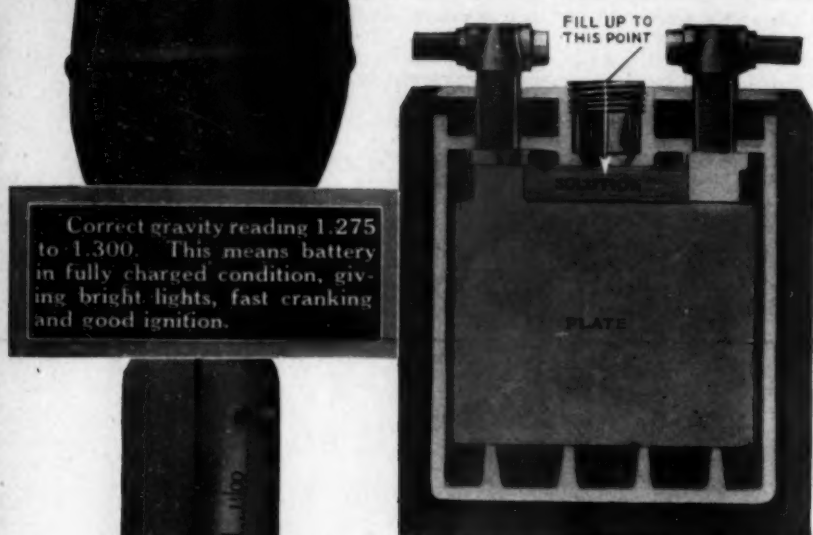
If a motor boatman gets into trouble and is in need of assistance all he has to do is to hoist the flag and the U. S. Coast Guard will soon be at his service

chart is shown in this article which should, however, enable one to find the way across the Inlet without great difficulty. There is good water at the lighthouse dock, and it would be a good plan to stop and learn whether any of the aids to navigation have been changed.

A few miles beyond Mosquito Inlet and above a drawbridge lies the little town of New Smyrna. The town or village is a very old one and some people think it older even than St. Augustine. It is probable, though, that St. Augustine antedates New Smyrna, and that the extensive ruins there are the remains of the plant of the notorious Turnbull, who worked his indigo plantations with people whom he lured to Smyrna by all sorts of

(Continued on page 52)

Giving The Battery



The electrolyte or solution in the cells should at all times completely cover the cells as illustrated above in a Willard battery. Add distilled water only for bringing the level to its correct height

THAT banner of the careless or the ignorant that "what we don't know won't hurt us," is waved to a certain extent by all of us. One man will say that as long as his motor is able to move a piston he doesn't worry about it, while another will contend that if the bilge remains reasonably dusty it isn't necessary to give his boat a periodic hauling-out and an application of more paint to the underbody. And we all know the man who mistrusts the strength of his tiller line, but postpones a minute examination of it, lest the search reveal the absolute and immediate necessity of fitting a new one. His sensitive soul revolts at the thought of climbing under the after deck and fussing with the quad-

Below: At the left is shown one plate of a frozen element. The real damage is done because of the different expansion coefficients of the active material and grid, causing the former to actually drop out of the grid. At the right is a plate which was in a battery that was charged at too high a rate. The extreme heat of over-charging of this nature causes the active material to soften and the plates to buckle or bend



Left: Hydrometer showing gravity of 1.300. The number in line with the solution level indicates the gravity of the liquid

rant in semi-darkness. But the storage battery, nicely enclosed in its steel box or hard rubber jar, comes in for the most neglect through the application of this principle.

There are many who reason that as long as it delivers enough juice for starting the engine, for lighting or even for ignition, it were better left well enough alone, disregarding the fact that a storage battery will give of its best for as long as it can, and that it will deliver a little current even after neglect has ruined it. Many who know better defer the weekly addition of a little distilled or rain water to replace that lost by evaporation, or omit the simple hydrometer test which reveals whether the cells are fully charged—as they should be at all times.

Before going into the proper care of a lead storage battery it is well to review for those whose memories are short the construction of an accumulator of this sort, and the principles under which it operates. It consists essentially of three parts—a water- and acid-proof container and the positive and the negative groups. Each group is subdivided into plates, which are in the form of grids with the interstices filled with certain lead compounds. Lead peroxide, which has a reddish brown color, is used as the active material for the positive grids, and sponge lead for the negative. When the positive and negative groups are arranged interjacent—that is, when the positive and negative plates alternate—the unit formed is called an element. In order that the alternating positive and negative plates comprising an element shall be kept from touching each other, a separator of treated wood or other suitable insulating material is interposed between each two. The application of a solution of sulphuric acid and water or electrolyte to the hard rubber container in which the element is placed converts it into a cell, and the storage battery may have one, two, three or more cells according to the voltage that is required.

Although storage batteries are often likened to tanks capable of holding water, it must not be supposed that electricity is stored in them as the water is stored in a tank. Actually the electrical energy given off by a battery is the result of a chemical action between the electrolyte and the positive and negative plates. Whether or not the battery is being used, this chemical action goes on continually, although when the circuit is open and the battery in disuse it is considerably reduced. It is sufficient, however, to exhaust the battery if it is left without recharging for any great length of time. This wholly natural condition has caused many owners to entertain the notion that the batteries they have bought and not used for two or three months are defective.

The chemical action between the electrolyte and the lead compounds in the grids changes the nature of both and results in the production of lead sulphate, a white compound which is deposited on and becomes part of the active material of the plates. The formation of the lead sulphate robs the electrolyte of some of its strength, until its potency, with the total discharge of the battery, is entirely dissipated. When this condition is reached the plates are covered thickly with lead sulphate, making them non-conductive of electricity, while the liquid is theoretically pure water. During the process of this chemical evolution a certain amount of electrical energy has been given off, and it is now necessary to send an electric current from a generator or some other charging source in order to recuperate it to its former strength. The chemical action on charge is just the reverse of that on discharge, and as more and more electricity is poured into the battery it transforms the lead sulphate present on the grids back into its component parts, so that the liquid becomes again a sulphuric solution and the active material on the grids the two lead compounds mentioned.

For the purposes of the above explanation it has been said that the battery when entirely exhausted must be recharged. It should be understood, however, that it is one of the worst forms of battery abuse to allow it to become totally discharged, as it materially impairs its subsequent efficiency.

Instead, it should be kept as fully charged as possible, shooting in new juice at the same time that the battery is being drawn upon by the lighting system, or, if this is not practicable, taking care that it is soon brought back to its original state.

How can we tell the battery's state of charge? Not by the use of an electric meter of any kind, but by employing a simple instrument known as the hydrometer. This consists merely of a hollow glass cylinder weighted at the bottom with shot, and graduated from 1100 to 1300 (or, more accurately speaking, from 1.1 to 1.3). It is usually sold in combination with a large glass tube having at one end a rubber bulb and at the other a removable nozzle. Unscrewing the vents from the tops of the cells, the nozzle of the tube is dipped into the solution in one of them and the bulb pressed. The air which has been expelled from the glass tube by this action is replaced by some of the electrolyte as the bulb is released, and the hydrometer,

A Chance

By Harry A. Tarrant

floating in the liquid, comes to rest and indicates its specific gravity. Each cell is tested in the same way. For absolute accuracy the cadmium method of testing is used, but a hydrometer test is sufficient for ordinary conditions.

Now, fresh water is said to have a specific gravity of 1 and if a given quantity of another liquid is one and a one-half times as heavy as the same quantity of water its specific gravity is 1.5 (and so on). Concentrated sulphuric acid has a specific gravity of 1.8, and the solution of it which is called electrolyte has a gravity of 1.3 (1300). This weight remains the same for the length of time that the battery is fully charged, but as the chemical process of discharge deposits part of the sulphur content of the solution on the grids the liquid becomes lighter and weighs at total discharge approximately 1.15, or only .15 more than pure water. By ascertaining, then, the specific gravity of the electrolyte, the battery is tested, and while every cell should read 1.28 to 1.30 it may be allowed to drop as low as 1.20. A slight variation of .01, say, for the various cells is permissible.

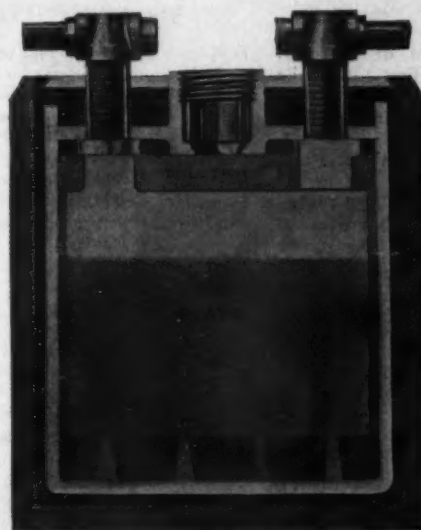
This test should be conducted every week and, as has been said, distilled water added at a like period of time. To obtain a true reading, the water should be added after the cells have been tested, as it has a tendency to rest for a time on the top of the heavier liquid already in the cells and will show an entirely false reading if the process is reversed. In the spring and fall when the weather is cooler the water need be supplied only every fortnight. It should be remembered that fresh electrolyte should never be added unless there has been a loss by leakage or spilling, as if it is it will only result in creating a "high acid" condition which will tend to loosen the active material on the plates, and disintegrate the separators, the latter causing the plates to short-circuit one another. Even in the case of spillage it would be well to let the nearest service station attend to the refilling if such a course is possible.

The troubles which may beset a well-made and properly cared for battery are few, and while any defects in a lighting, starting, or ignition system should be traced first from the battery (as it is most easily tested), they will probably be found due to dirty terminals, loose connections, abraded cables or the like. But the misfortunes which can and will heap themselves upon an ill-used battery are manifold and don't stop short of total destruction. The "high acid" condition referred to in the preceding paragraph is serious, but it is occasioned more by sins of commission than of omission.

Occupying a stellar role among the latter is that of allowing the water in the cells to evaporate until a part of the plates is exposed. If one-quarter of the plates is uncovered the output from that cell will be 25 per cent. under normal, while the lead sulphate deposit will harden under exposure to the air, and, after the water has been brought up to its proper level, it will require careful and perhaps repeated charging at as high a rate as is possible without overheating to restore the battery to its normal state. A similar condition—that of hardened sulphate—will result if the battery is undercharged. The remedial measures are the same, but it may be said that an ill done a storage battery can never quite be compensated.

Overcharging is quite as harmful as the opposite condition, for after a battery is fully charged, the current passing through the solution breaks up the water in it and causes the formation of bubbles. The heat produced in this way has a deteriorating effect on the plates, tending to soften the active material and bend the grids. Another harmful effect from overcharging is the formation of gases in the plates themselves, which gases in endeavoring to get out push out the active material as well. The remedy is, of course, obvious. If one uses his boat much in the daytime and the lights little at night, the switch may be thrown out when a hydrometer test reveals that the battery is fully charged. This test can also be made by taking the temperature of the electrolyte—if this proves to be as high as 105 or 110 degrees F. the battery is overheated, and no further charging should be given at this temperature. Some of the modern systems are so arranged that the charging current of the generator may be regulated, and if a day's run is to be made it is advisable to reduce the charging rate to meet the conditions. Another evil attendant upon allowing the solution to fall below its proper level is closely linked with the deleterious effects of overcharging, for if the plates are not entirely covered, the amount of charging current which is correct for a normal battery will reach them at too high a rate and will cause overcharging with its consequent disintegration of the grids.

The matter of caring for the storage battery in winter is a very important one for the boat owner, as very few boats are stored in warm places. A battery that is fully charged will not freeze at any temperature which strikes the temperate zone, but a three-quarter discharged battery will be subject to the congelment of the electrolyte at zero (F.) It is therefore essential that if the battery is left aboard the boat it be tested frequently and kept fully charged. It is really a saving of time and trouble to leave the battery in charge of a service station or some reliable electrician with instructions to periodically charge

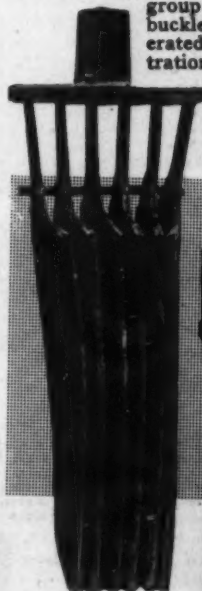


This shows a section of a battery in which the electrolyte is far below the correct level that is shown on the opposite page. Allow the solution level to remain low and you must be satisfied with a reduction in battery efficiency. Keep the cells up to level by adding distilled water weekly in summer and every two weeks in winter

and discharge it and keep it properly filled

Perhaps some will prefer dry storage in which the battery is first fully charged and then dismantled and the separators removed. These may be thrown away, as new ones must be supplied in the spring. The plates are washed in water for about twenty minutes and then placed in a dry place. When the battery is again to be used, new electrolyte is added and the battery is ready for service. The length of life of the battery is increased for just the length of time that it is kept in dry storage, as the plates undergo no chemical change while in a dry state.

Below: The illustration at the left shows a group in which the plates have buckled due to excessive heat generated in over-charging. The illustration at the right shows a plate of an element which was charged with the solution far below level. Notice the white sulphate on the upper half of the plate which practically cuts that half out of service



At extreme right is a hydrometer showing low gravity of electrolyte



Gravity under 1.200 indicates a discharged battery. In this condition it will cause the cranking motor to turn slowly and the lights to burn dimly.

Practical Wireless for Motor Boats

The Selection of the Receiving Apparatus Best Suited to the Requirements of the Motor Boatman—The Third Article of the Series Appearing in MoToR Boating

By Austin C. Lescarbours

NOT unlike the position of the man about to purchase his first automobile is that of the motor boat owner about to install his initial wireless apparatus. The comparison is unavoidable: both are confronted with an almost infinite variety, and with almost countless claims for the merits of each particular type or make of machine or apparatus. Advice is to be had in profusion. A thousand and one opinions are to be heard on all sides, adding to the already existing confusion.

However complex the situation appears at first glance, it rapidly sifts down to the simple matter of selecting apparatus best suited to the particular requirements at hand and to the motor boat owner's pocketbook.

To cover the entire category of receiving apparatus in the present article would be impossible; and even if it were possible it would be but a useless repetition of the information contained in the literature of the manufacturers of wireless apparatus. It is the purpose of the author, rather, to simplify the selection of receiving apparatus in what follows; to point out what to look for and what to avoid in making one's selection.

The function of a wireless receiving set is two-fold: first, to detect the weak currents induced in the aerial system by the wireless waves, which currents flow down through the lead-in wire, through the instruments, and thence to the ground; second, to render the passage of the weak electric currents susceptible to one of the

tion, such as galena, iron pyrites, molybdenite, and silicon, or between two dissimilar crystals; and the audion, which, popularly explained, is a form of electric lamp containing electrode members besides the usual filament. By far the audion is the ideal detector for all receiving sets; but the decision of the courts against the manufacture of the audion in recent patent infringement proceedings makes it very doubtful indeed that this type of detector will be available for amateur needs for years to come. Hence the audion must be eliminated from present consideration; by necessity our choice is limited to the crystal detector.

It must not be supposed that a receiving set is complete if it includes a detector and telephone receivers. While it is true that these two essentials may serve to receive signals from a nearby transmitter, to receive signals over any appreciable distance it is necessary to use supplementary apparatus for the purpose

turers may be divided into two general classes, as concerns receiving apparatus: first, complete receiving sets, with the various components mounted in some form of cabinet; second, separate pieces of apparatus which can be purchased one by one and arranged by the buyer to suit his convenience and fancy. If the motor boat owner wishes to solve his radio



An ideal receiving set for the motor boat station, complete in every detail and entirely self-contained. There is a minimum of work in installing a complete wireless receiving set: a wire is brought from the aerial to one of its binding posts, and another wire is brought from the ground to the other post. It is wireless "with the bother left out"

Compactness, neatness and simplicity are the cardinal features of this receiving set, which is mounted in a neat yet substantial cabinet fitted with a hinged cover. It is provided with a loose coupler and two variable condensers, but does not include the detector, for the reason that many purchasers desire to use different detectors, which can be connected to binding posts provided for the purpose. It is a typical moderate-priced set

human senses. In the early days of wireless communication the currents were made to operate a Morse register, which printed long and short dashes and dots on a paper ribbon so as to appeal to the operator's sense of sight. Today, however, the art makes use of more delicate apparatus, which converts the infinitesimal currents into long and short buzzes issuing from a pair of telephone receivers worn on the head of the operator.

The heart of any receiving set is that member which detects and makes known the passage of signal currents. This member is known as the detector. Of the many types of detectors in use at present, only two are suitable for a motor boat station: the crystal detector, which makes use of a delicate contact between a metal point and a mineral of crystal forma-

We must all make a start, and to many a wireless amateur this simple set is his start. It consists of a tuning coil, detector, and telephone receiver, and although most moderate in price it serves satisfactorily for short distance work. It is the "Ford" of wireless receiving sets

of making the detector respond to one particular wave length. This is known as tuning, and the apparatus for the purpose is known as the tuning apparatus or tuner.

The offerings of wireless manufac-



A high-grade receiving set of the commercial type, which utilizes the audion as the detector. Owing to recent patent litigation this peerless detector, and sets using it, will not be available to wireless amateurs for perhaps years to come

station problem in the most expeditious manner, surely the best procedure will be to purchase a complete receiving set. On the other hand, if he is desirous of arranging the apparatus in some particular way that suits him best, the alternative of purchasing separate pieces of apparatus is to be resorted to. It must not be supposed that a complete receiving set is much more costly than separate instruments; for, while it is a fact that the complete sets are somewhat more expensive than separate pieces of apparatus, when it is borne in mind that the former is complete and self-contained, cabinet and all, and ready to operate, the purchaser is soon convinced that the slight advance in price is more than justified.

Another consideration before purchasing

wireless apparatus is that of the aerial. If the motor boat for which the apparatus is intended is of a modest size, say of 30-foot length or even less, it would hardly make it worth while to purchase elaborate and expensive apparatus for the reason that the short aerial available on such a craft limits the effective receiving and sending range. Here is a striking analogy: Why use a gallon container for holding a quart of milk, when a quart container will serve the purpose just as effectively? In the case of a larger boat, however, the purchaser should not hesitate to consider more elaborate equipment, since with the larger aerial available the better grade apparatus can be advantageously operated.

To return to the actual apparatus: Crystal detectors are available in a wide range of designs, although all are based on the same general principles. For ordinary amateur stations on land a type known as the "cat whisker," employing a

ceivers have the further advantage of shutting off extraneous noise.

The tuning of a receiving station is effected by any of a number of instruments, the most common of which are the variable condenser, loading coil, tuning coil, loose coupler or receiving transformer, and variometer. The first of these, the variable condenser, when connected in series with an aerial system, serves to shorten the natural wavelength of the aerial, hence of the receiving set. The same instrument, when placed across the winding of a tuning coil, serves to lengthen the wavelength of the receiving set. A loading coil, consisting of many turns of insulated wire on a cardboard tube or on a wooden, fiber, or hard rubber rod, serves to lengthen the wavelength of a receiving set in big steps, in contradistinction to the tuning coil which regulates the wavelength by small steps. A loading coil is only necessary when the aerial system is of a very short wavelength, which is

proved, especially as regards its tuning qualities—picking out any desired signals to the greater or lesser elimination of all others. A somewhat better set calls for a loose coupler instead of the tuner, which can be improved by the introduction of a variable condenser, and still further bettered by the intro-



Here is a complete wireless station with the receiving instruments (at the right), the transmitter (in the center), and the battery container in separate and portable cases. This apparatus can be removed from the motor boat at any time and used by its owner in his home during the winter months, or at a camp in the summer

fine piece of copper wire pressing down on a small piece of mineral, is highly satisfactory. But owing to the vibration from the engine on board a motor boat, a delicate device of this kind is hardly suitable. Fortunately, there are other types of crystal detector, of designs that are not affected by intense vibration. This, then, is an important point to watch out for in purchasing a detector or even a complete set.

In connection with the detector and other apparatus, there should be employed a pair of sensitive telephone receivers, fitted with a head band so that they may be held to the ears without the use of the hands. The efficiency of any receiving apparatus depends largely on the excellency of the telephone receivers employed in connection with it, so that the purchaser will do well to secure the highest grade of receivers he possibly can. In fact, it is far better to economize on other pieces of apparatus than on the telephones, for these, together with the detector, go to make the foundation of a receiving set. The receivers can be obtained either single or double, mounted on a head band. If the cost is not the prime consideration, it is by all means recommended that a double receiver head band be purchased, although good results are obtainable from a single receiver, provided the receiving set is to be used in a cabin that is reasonably free from noise. Aside from making the signals more audible, the double re-

often the case on a small motor boat, or in instances where it is desirable to receive signals of exceedingly long wavelength sent out by high-powered stations. Most motor boat wireless operators will wish to employ loading coils in order to receive the all-important weather and press dispatches from the Arlington (Va.) Government station. Still another tuning apparatus is the loose coupler or receiving transformer, which is a more efficient form of tuning coil. Whereas the ordinary tuning coil has but one winding, the loose coupler has two, a primary and secondary, the latter adjustable with regard to its position in relation to the former. It is due to this feature that it derives its name of loose coupler, which is in reference to the loose inductive coupling between primary and secondary coils. Not as common as the foregoing instruments but none the less efficient is the variometer, which alters the wavelength of a receiving circuit in which it is placed. A fixed condenser completes the category.

Now that the reader is at least on speaking terms with the various receiving instruments, it is possible for him to obtain a brief idea of the requirements for different receiving sets. Taking first the small craft, the set can be made up of a simple tuning coil, a small fixed condenser, a detector, and a pair of telephone receivers. The same set, by the addition of a variable condenser, can be materially im-

To those who prefer to purchase each piece of apparatus separately so as to mount them in some special way, this illustration is of interest, for here are a number of components of a high-grade receiving station. At the left is a large loose coupler, then an audion of the tubular type, and two long loading coils, while in front are four variable condensers and a pair of receivers

duction of a second variable condenser. A set of the latter type may be used with a short

These—the telephone receivers—the operator must wear to hear the wireless messages passing through space. As no two heads are alike, the head bands of all receivers are provided with a variety of adjustments to fit the ear pieces to the ears without discomfort on the part of the wearer. And the head band receivers must be light, for they are often worn for hours at a time

aerial, although its use is more justified with an aerial of fair length. The apparatus suggested (Continued on page 56)

Mariette, A Gear Reduction Auxiliary

A Handsome Herreshoff Schooner Which Is Equipped with an Eight-Cylinder Motor of the High-Speed Type

AS the seasons follow each other around the calendar the sailboat men come more and more to realize the immense superiority of the auxiliary over the out-and-out sailer, and so each year we find the number of motor-powered vessels augmented. Some windjammers there are, no doubt, who remain wedded to their old-fashionedness, but they are no longer able to advance any legitimate argument against the installation of a gasoline engine in a sailing vessel. Marine motors are no longer objectionable from any of the half dozen counts which were registered against them in their infancy, and they neither mar the beauty of a yacht's lines nor occupy otherwise valuable room.

The schooner shown in the accompanying illustrations looks like a sailing vessel pure and simple, and you



The beauty of the sails is there—and the unfailing power of the engine



One of the guest rooms—the lavatory is an interesting feature of the equipment

could hardly ask for a more beautiful craft than she when clothed in her full suit of sails. Yet tucked away down in her in'ards is an eight-cylinder motor which, at the failure

of the wind, leaps into life at the touch of a button and drives her along at a speed fully equal to that of the average motor cruiser.

Mariette was designed by Nat Herreshoff and built by the Herreshoff Mfg. Co., of Bristol, R. I., for Jacob Frederick Brown, of Boston, Mass. She is 109 feet in overall



The main saloon is characterized by roominess and comfort. The steel deck beams give an indication of the strength of the hull



The owner's stateroom in Mariette is a large compartment finished in mahogany and enamel

length and 80 feet on the waterline, by an extreme breadth of 23 feet 9 inches. She draws 16 feet 3 inches and is of steel construction. The lines of her hull closely resemble those of Resolute and other famous sailing vessels from the boards of this designer.

From the motor boatman's point of view, the most interesting part of Mariette is her power plant. This is a standard eight-cylinder $5\frac{1}{2} \times 6$ -inch 135 h.p. Van Blerck motor connected to the propeller shaft through reduction gears, having a ratio of $1\frac{1}{4}$ to 1. On her trial trip she did a little better than $8\frac{1}{2}$ knots, which is equivalent to nearly 10 statute miles per hour. The motor is located in the lower hold below the main saloon and does not interfere in any way with the room on the cabin deck.

Navajo III, Out-and-Out Cruiser

A 67-Footer Whose Design Shows That There Are Still Some Yacht Owners Who Rank Superior Accommodations Above Exceptional Speed—Comfort-Giving Equipment Throughout



Navajo III is a Seabury cruiser owned by A. P. Clapp, of New York

WHILE many of the motor yachts that made their initial appearance last spring are of the express cruiser type, there are many others of the out-and-out cruising variety, intended to provide a maximum of comfort and at the same time have a fair speed with an economical consumption of gasoline.

Such a craft has recently been delivered to Arthur P. Clapp, of the Marine and Field and Manhasset Bay Yacht Clubs by the Gas Engine & Power Company and Charles L. Seabury & Company, Consolidated, of Morris Heights, New York City. This new vessel has an overall length of 67 feet, a beam of 13 feet and a draft of 3 feet 6 inches. A 120 h.p. Speedway motor drives the boat at a speed of



A view of the two staterooms immediately abaft the engine-room

The 120 h.p. Speedway motor gives an economical cruising speed of 13 m.p.h.

Photographs by Rosenfeld

over 13 miles per hour, which is in excess of that of the average out-and-out cruiser.

The interior accommodations of Navajo III are

unusually roomy and well laid out. Starting forward, she has a chain locker running aft for 5 feet, then the forecabin with a length of 14 feet, and having four berths. A storeroom is next aft, and then comes the galley running the full width of the vessel. The

engine-room is 10 feet long with fuel tanks on either side, each holding 150 gallons.

The owner's quarters comprise two staterooms abaft the engine-room, followed by the companionway and lavatory on the starboard side, with a berth opposite so arranged as to be converted into a single stateroom by a sliding curtain, and a double stateroom farther aft.

A dining saloon forward is sunken below deck, extending aft from over the after part of the forecabin and



The sunken dining saloon forward extends over part of the forecabin and is connected directly with the galley

partially over the galley.

There is a flush after deck about 9 feet long, and a bridge deck from which the vessel is steered, with a complete motor control alongside of the steering wheel. The yacht is equipped with a single stack and a signal mast, the former carrying the exhaust from the motor.

Navajo III is of the raised-deck type, with plenty of freeboard and a good flare forward, and a canoe stern, and is declared to be a fine vessel in a seaway despite her light draft.

The Conversion of a Whaleboat

A Seaworthy 30-Foot Motor Cruiser Which Was Reconstructed From a Government Condemned Hull—How to Evolve a Serviceable Craft From a Little Ingenuity and a Little Money

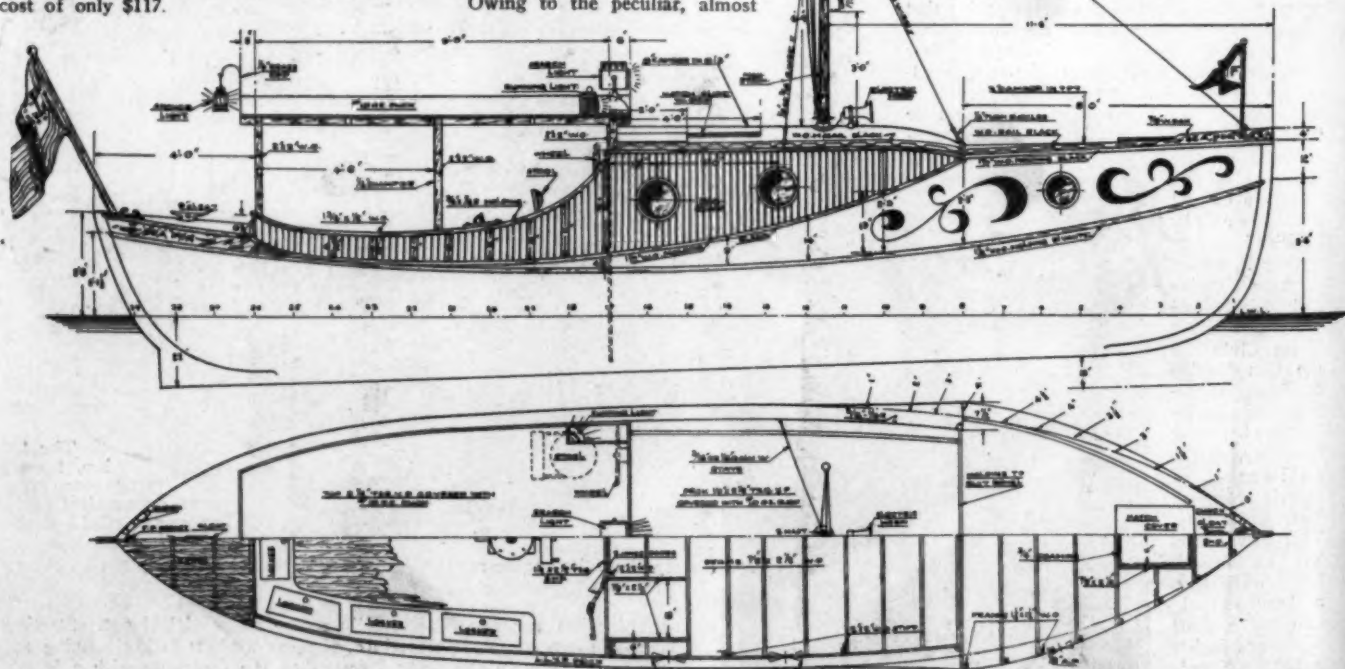
EVERY year Uncle Sam hangs the For Sale sign over a number of condemned small boat hulls and lets them go at prices ranging from \$30 to \$50 each. Many of these are converted into motor boats, but it has remained for W. R. Snows, of Philadelphia, Pa., to fashion one of them into a modernized cruiser. The accompanying plans show plainly what can be done with a standard 30-foot whaleboat, a combination raised-deck and hunting cabin cruiser having been constructed from these designs for a member of the Farragut Sportsmen's Association at a cost of only \$117.

The boat is powered with a single-cylinder motor developing 10 h.p., and under average conditions attains a speed of 7½ to 8 m.p.h. The engine is located in the cockpit and is enclosed with a portable housing, the controls being led to the bulkhead. The fuel tank is carried under the after deck and thus the cabin is left absolutely unobstructed, while there are no odors from gasoline or exhaust gases.

Owing to the peculiar, almost

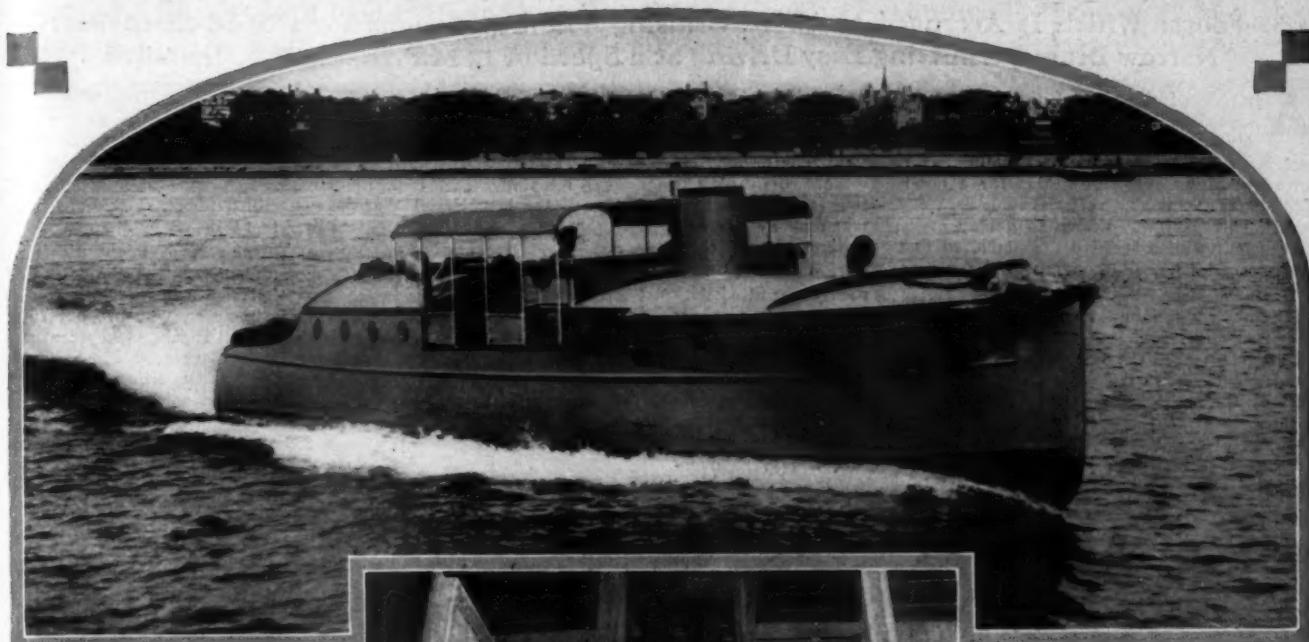
circular sheer, the whaleboat presents a perplexing problem when it comes to constructing a ship-shape cabin. However, this has been done quite successfully in the present instance, and the owner is well pleased with its appearance as well as with its roominess.

Further compensation for the excessive sheer is provided by the heavy cockpit awning, which also helps materially in removing any resemblance to an open boat.



Sectional profile and plan view of a whaleboat cruiser which was devised by W. R. Snows. The matter of adapting the cabin to the almost circular sheer was one of the most difficult problems encountered

"The Largest 48-Footer Afloat"



Sabot very closely resembles a miniature war vessel and has a 22-mile speed

THAT there are degrees of size even in boats of identical exterior dimensions has long been maintained, but here we have a military type express cruiser whose owner, M. T. Clark, of Chicago, Ill., pronounces her "the largest 48-footer afloat." Sabot, as she is called, was designed and built by the Great Lakes Boat Bldg. Corp., of Milwaukee, Wis., and with her low racy lines strongly resembles a small war vessel.

The effort was made in her design to provide for utilization of every foot of space from the crew's quarters forward to the commodious cockpit aft. Space has been made available in the bow for a crew of two, the forecabin being separated from the galley by a water-tight bulkhead. The galley is complete in every detail and includes a refrigerator, which in addition to an ample supply of provisions has room for



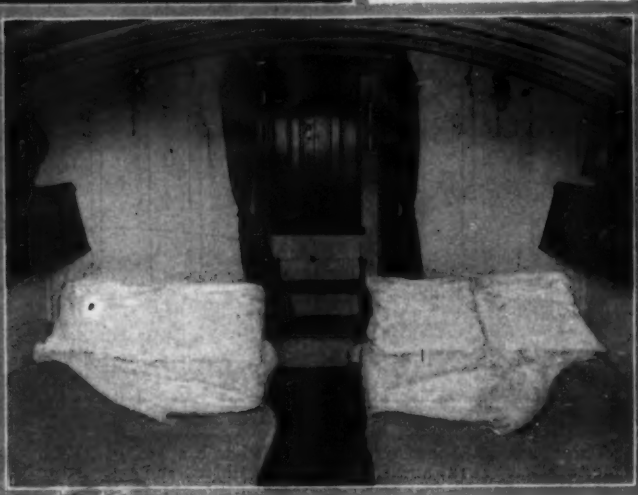
At the left, looking through the bridge hatchways, is seen the Van Blerck motor

three hundred and fifty lbs. of ice.

Following the galley is the main cabin, which is richly finished in matched mahogany and ivory, and is upholstered with tapestry. The seats and backs are so designed as to give comfortable sleeping accommodations for four persons. Aft of this cabin is placed the eight-cylinder Van Blerck which is housed under the bridge, accessible by removable hatches.

A lavatory is provided on the port side aft of the bridge, and is opposite to a built-in clothes locker. Following the toilet and wardrobe is the owner's stateroom which is furnished with two extension berths.

The hull structure which is a combination of the sawed frame and batten construction is peculiar to this cruiser, being used in connection with steam bent frames spaced closely and running from gunwale and gunwale over long battens which back every plank seam.



The owner's stateroom and forward cabin are finished in mahogany and ivory white enamel. The upper view shows the forward cabin looking forward, and the illustration in the left-hand corner a glimpse of the port side of this compartment, while the view at the right depicts the forward end of the owner's stateroom

A Well-Arranged Cruiser

A 35-Footer Which Is Arranged to Afford Cruising Accommodations for a Good-Sized Party—Narrow Beam Permitting Easy Driving at a Speed of 12 M.P.H.—25 H.P. Installed

A BOAT of the size of this cruiser designed by Sam Brown, of Marblehead, Mass., seems well adapted to the demands of the average motor boatman, as it affords cruising accommodations for a good-sized party and is also very desirable as a day boat. This plan was drawn to get an easily driven hull with a speed of 12 m.p.h. so that there would be good economy in the use of the power.

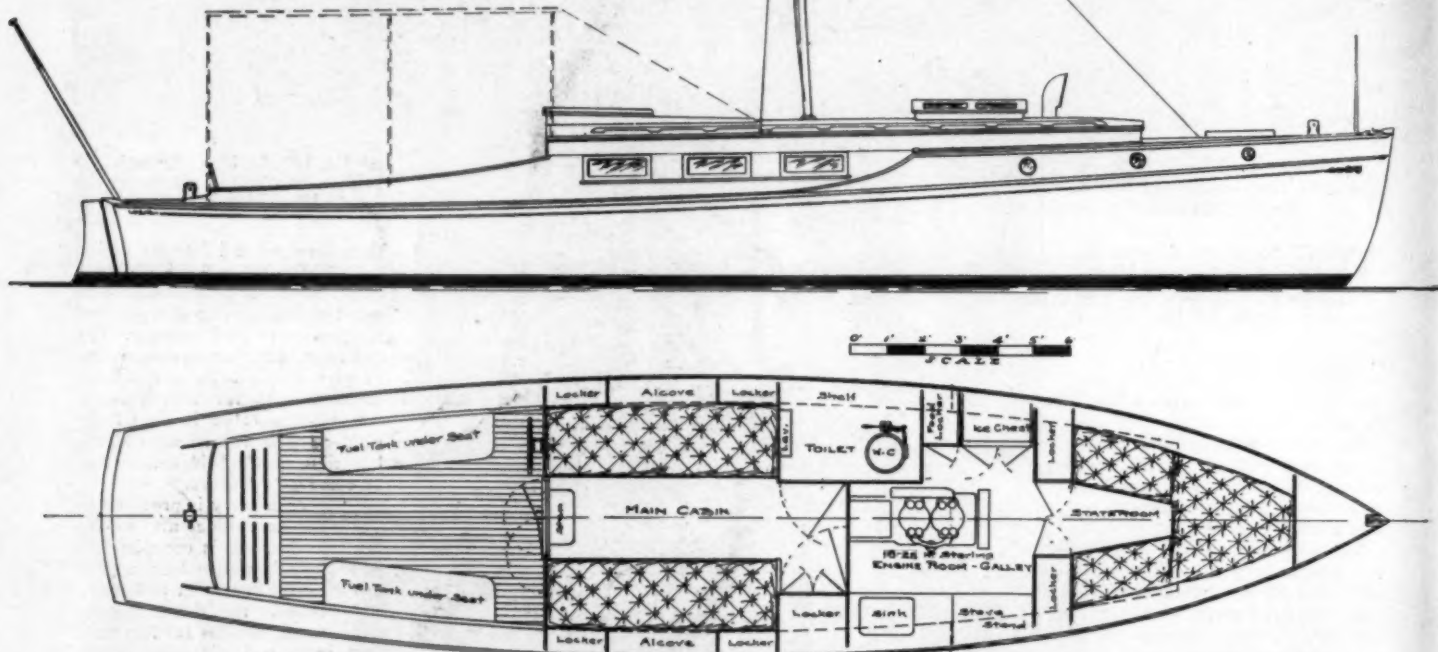
The interior is laid out with the main cabin aft fitted with small lockers and alcoves back of the transoms. The toilet room adjoins the main saloon forward on the port side, while part of the space opposite it is taken up by a large locker. The engine-room is directly forward of this and contains a four-cylinder Sterling motor of 18-25 h.p. In addition to

the engine this room holds the galley equipment, consisting of stove stand and sink on the starboard side, and icebox and food chest opposite, with opposed remainder of the boat is w a r d locker.

The cockpit is a roomy one fitted with a lazy-back seat aft and two seats along the sides. The fuel tanks are located under these side seats so that any leakage will drain into the cockpit and so over-

board through the scuppers. The controls are all led to the helmsman's position at the forward end of the cockpit on the port side. The boat is of the raised-deck type with skylight over the engine-room and cabin companionway at the center of the boat. Her dimensions are 35 feet by 7 feet 9 inches by 2½ feet.

Some hypercritical persons might object to having the motor planted in the middle of the scene of operations as it is in this cruiser. There are many, however, who are not fully happy unless their mill is where they can cast frequent affectionate glances at it, while we know several enthusiasts who contend that the trick below on a long distance race with the engine humming three feet from their ears is the one time of the year to sleep soundly.



In addition to two living compartments below, this 35-footer is arranged with an exceptionally large cockpit. An 18-25 h.p. Sterling motor which will give a speed of 12 miles is specified in the plans



Photograph by Edwin Levick

Get There, a new 58-foot express, which has a speed of 30 miles an hour. She was designed by Tams, Lemoine & Crane for J. S. Bache, of New York, and in appearance differs radically from the ordinary type of fast boat. She is equipped with two Van Blerck eight-cylinder motors of 200 h.p. each

Adios II, a Twin-Screw Runabout

Powered with a Pair of Duesenberg Sixes Which Give Her the Phenomenal Speed of 40 M.P.H.—
Mahogany Hull of Unusual Strength and Beauty—Two-Cockpit Telegraph Control



Adios II is owned by L. L. Biddle, of Philadelphia, who uses her at Islesboro, Me.

NOT only because she was the first boat in the water with a pair of Duesenberg engines, but because she has a speed of 40 miles an hour, is Adios II one of the most interesting craft of the 1916 season. She was designed by Bowes & Mower for L. L. Biddle, of Philadelphia, for use as a fast sea-going runabout at Islesboro, Me. Although no speed guarantee was asked, it was required that the new boat should be faster and at the same time more seaworthy than the first Adios. In order to satisfy the owner that this result could be accomplished, the designers took off the lines of the old boat and had a model made of her to test in competition with a model of the new boat at the Government experimental basin in Wash-

ington. In spite of the fact that the new design had a foot greater beam, the model showed less resistance, except at low speeds, than the older boat.

The arrangement of the hull



Photographs by Pearce

When under way the six-cylinder Duesenbergs are covered by hinged hatches which have an opening aft for the engineer

whose station is in the engine compartment. The hull is planked and finished completely in mahogany, and is a credit to the builders, the Mathis Yacht Bldg. Co., of Camden, N. J. It measures 56 feet 7 inches over all by an extreme beam of 6 feet 10 inches and a greatest draft of 2½ feet. The two Duesenberg motors with which Adios II is powered are six-cylinder machines with 6¾ x 7¾-inch bore and stroke, developing 250 h.p. each at 1,250 r.p.m.



Each cockpit is fitted with steering wheel and engine-room telegraph

shows the engines amidships, slightly staggered on account of the narrow beam of the boat. A steering wheel is fitted in each cockpit so that the boat can be handled from either place, but the engines are controlled entirely by a paid hand

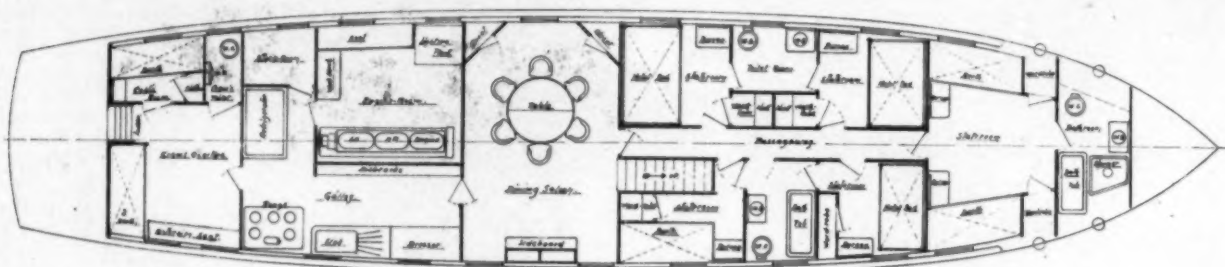
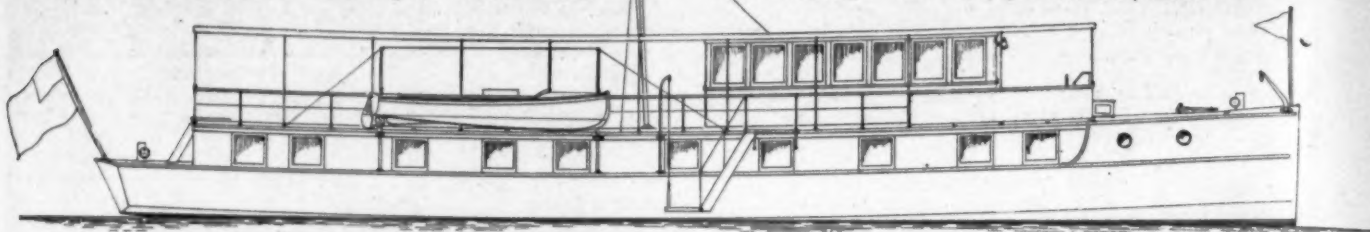
A V-Bottom Houseboat

THE accompanying plans are of an 83 x 18-foot V-bottom houseboat owned and operated in the charter business by McCoy Bros., of Daytona, Fla. She is pow-

ered with a six-Standard and is Matthews electric Her finish and

cylinder 60 h.p. equipped with a lighting plant. furnishings

are of the best type throughout, and among her features are hot and cold, salt and fresh water baths. Owing to her tunnel stern the draft has been kept down to 30 inches.



Although 83 feet in length and drawing only 30 inches, the underbody design of this houseboat is such that she may be referred to as of the V-bottom type. She has been built for the charter business at Daytona, Fla.

A 32-Foot Limousine Runabout

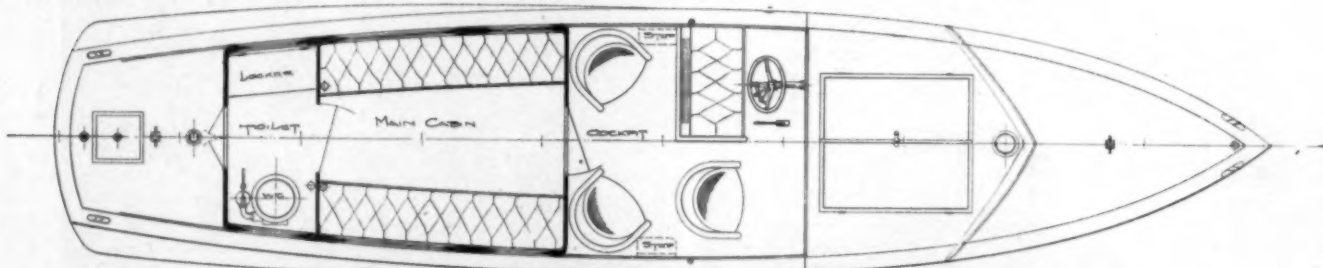
THE cruiser shown below in line and half-tone is a 32-footer designed and built by the Matthews Co., of Port Clinton, O., for private use in the vicinity of the Chautauqua summer resort at Lakeside, O., and for general cruising in the neighborhood of the Put-in Bay Islands.

Verhoo, as she is called, has a beam of 7 feet and a draft of 2 feet 4 inches, and a speed

of 20 miles an hour is obtained from a four-cylinder 5½ x 6-inch Van Blerck motor. Perhaps the most salient feature of the boat is the limousine cabin which gives perfect protection while permitting a commanding view. All the windows in this cabin are arranged to drop into pockets so that, if desired, the entire cabin may be thrown open in good weather. High freeboard and liberal beam make the boat

an excellent one for day cruising where the waters are reasonably sheltered.

The construction of the hull throughout is very strong, with all joiner work of the exterior cabin in mahogany. The windows are of heavy plate glass, equipped with Pullman roller shades. There is an entrance to the cabin aft and another forward from the operator's cockpit.



Plan view of Verhoo, showing the arrangement of the motor compartment, central cockpit and limousine cabin aft



Verhoo adapts the limousine idea to boat construction very successfully. She makes an ideal type of boat for day cruising in waters which are reasonably protected



Have You Stopped That Leak?

Perhaps You Haven't Even Been Successful in Tracing It—In Which Case You Should Be Glad to Learn Where It Is Most Liable to Originate, and What Are the Best Methods of Getting After It

THE PRIZE CONTEST—Answers to the First Question in the September Issue

Reviewing All the Vulnerable Spots

(The Prize-Winning Answer)

It has often and truly been said that water will leak in where it will not leak out. Hence it is that a leak along the garboard is sometimes hard to locate from the fact that when the boat is hauled out, the whole of its weight comes on the keel, rather than being distributed over the wetted surface of the hull, causing the opening to be lessened to such an extent that the water will not leak out.

A garboard constructed as in Fig. 1 (page 24) and in Fig. 2 would tend to close under these conditions, while one after the pattern of Fig. 3 would be likely to open, especially if the hull had water in it when dry-docked, or the bilge blocks by being improperly placed were exerting an uneven and abnormal pressure on the bilges.

If the flooring and the ceiling make the easy examination of the hull a difficult matter, water should be allowed to be in the boat when she is dry-docked. Even "seeping" leaks are located by this method. Or a careful examination of the seams, even if there is no water in the hull, will show flaky edges at the places where leaks are likely to be found. Badly discolored or dead-looking calking is always indicative of leaky conditions.

Nothing is gained by a hurried job in fixing leaks. Take plenty of time and locate all of them. Mark their terminals with chalk. Calk with the best yacht cotton and get it into the seams evenly. Make sure that the junction with the old calking is not abrupt, bringing the ends of the new to a rat-tail finish.

Butt blocks are often the source of leaks. They may split and allow the fastenings to become loose, and the butts beginning to "work," spit out the calking. To overcome this, fasten new butts of $\frac{3}{4}$ - or 1-inch white oak over the old butt blocks and the adjoining ribs and re-rivet the butt ends to them.

If for some reason the seam has lost its V shape, a batten placed between the ribs will hold the calking and allow it to be driven home properly. Never drive the calking in too hard, nor cram the seam with cotton. Even cotton calking swells appreciably, and this action in conjunction with the pressure that accompanies the calking of the seams may cause otherwise good seams to open at both ends of the place that is calked.

Before attempting to calk the garboard, be sure of its construction. Ones made similar to Fig. 1 and Fig. 2 can be calked with a reasonable chance of remedying the leak, but one constructed as in Fig. 3 is only made worse. Such a garboard should be drawn to the keel with screws and puttied. Sometimes a little lamp wick, pressed into such a garboard, is

advisable. Before puttting any seam treat it to a coat of paint and allow it to dry.

Leaks in the chine of V-bottom boats are fixed by drawing the planks to the chine piece, followed by light calking and puttting.

The shaft log is often leaky because of season cracks. Copper patches will remedy the evil, but they are unsightly and hurt the chances of getting a fair price for the boat in case the owner wishes to sell. A brass pipe with stuffing boxes at the inboard and outboard ends is always a sure cure for leaks under this head.

Stopwaters that are found to be loose ought to be driven out and new ones of soft pine inserted. These should not be pencil shaped; one end slightly larger than the other is the proper procedure.

Many garboards are cracked when first put in position and later develop into full-fledged leaks. A heavy coat of paint on the interior surface and puttting on the outside is the first remedy to be tried and if this does not stop the leak, a thin batten on the inside laid in thick paint is the only recourse other than putting in a new garboard.

As in all cases, an ounce of prevention is worth a pound of cure. Lay up the boat prop-

erly in the fall, giving her as much protection as possible against rain, snow and March winds. Do not start the motor for a few days after going over in the spring, as the vibration may spew out the putty from the planks that have not a firm contact with their neighbors. At all times when afloat keep the boat from resting on mud flats and from heavy impacts from landing stages.

JAMES E. MURPHY, New London, Conn.

Look Well to the Calking

WHEN a boat which has a leaky hull is in the water the leak can usually be located in the following way: Remove all floor boards, traps or hatches so as to be able to inspect as much of the bottom of the boat along the keel as possible. Then pump out and sponge the bilge as dry as you can. Now watch closely and you can soon determine where the water is coming in.

Should the hull be out of water, bad leaky seams can be located with the point of a knife, for they will feel soft and hollow, allowing the knife blade to be pushed in some distance, while tight seams will be hard and firm. The seams along the keel at the lower edge of the garboard streak are most likely to need attention, because when the boat is hauled out there is often a small quantity of water left in along the keel. This keeps the calking wet until freezing time, and then the ice forces the planking away from the keel. Then, too, this seam, being more difficult to fit than the others, is often not so well done. Sometimes there are places where the seam is open more on the inside than the outside, which makes calking almost impossible.

Another place where bad seams are found in old boats is around the bilge, at or just below the waterline. This is caused by the frames giving away and allowing the planks to spread, and it is satisfactorily remedied only by fitting in short frames around the turn of the bilge. If the calking is first removed and the frames are fitted a little slackly, then the seams will be closed up as the planks are fastened and drawn up to the frames.

When the boat is out of water examine the seams, and all that are soft or show loose calking should be removed. This is easily done by bending a small hook in the tang end of a flat file, and using this to rake the calking out. Then re-calk and paint the seam well with good lead paint, working the paint into the seam with a short stiff seaming brush made for this purpose.

When a leak develops while the boat is in commission and it is not desired to haul her out, it can usually be stopped by battening the seam from the inside.

A case that came to my notice a short time ago will serve to illustrate. The owner of a fast runabout had broken a wheel when he struck a deadhead the night before, and in do-

Questions for the January Issue

1. What type of engine should be installed in a cruiser—a heavy slow-speed machine, or a lighter one of medium or high speed?

Suggested by H. H. P., Oakland, Cal.

2. Describe and illustrate the best and most convenient method of carrying shore clothes aboard an open boat.

W. K. D., Upper Montclair, N. J.

3. Design and give instructions for building a set of boarding steps.

C. E. D., Stapleton, N. Y.

Rules for the Contest

Answers to the questions, addressed to the Editor of MoToR Boating, 119 West 40th St., New York, must be (a) in our hands on or before November 20th, (a) about 500 words long, (c) written on one side of the paper only, (d) accompanied by the senders' names and addresses. (The name will be withheld and initials or a pseudonym used if this is desired.) Questions for the next contest should reach us on or before the 20th of November. The Editor reserves the right to make such changes and corrections in the accepted answers as he may deem necessary.

The prizes are: For each of the best answers to the questions above, any article advertised in the current issue of MoToR Boating, of which the advertised price does not exceed \$25, or a credit of \$25 on any article advertised in the current issue of MoToR Boating which sells for more than that amount. (There are three prizes—one for each question—and a contestant need send in an answer to but one if he does not care to answer all three.)

For each of the questions selected for use in the next contest, any article advertised in this issue of MoToR Boating, of which the advertised price does not exceed \$5, or a credit of \$5 on any article advertised in this issue of MoToR Boating which sells for more than that amount.

When you send in your answers you must state what you will take for a prize should you win one

ing so started a bad leak near the stern. He was busily engaged trying to calk the boat from the inside and was making it leak the more, when he asked for advice.

An examination showed a very bad seam along the keel. Someone had driven the calking too hard so that it had broken the edges of the planking and gone through in places. This made a seam difficult, if not impossible to calk, so we decided to batten the seam between the frames. Some pine strips about two inches wide were sawed off to fit between the frame; then a strip of light cotton was cut to fit under the blocks. As the water was coming in all the time, paint would have been useless, so I thought of a small can of tallow and white lead I had aboard my boat. The cotton was well coated with this mixture, placed over the leaks and the blocks nailed down, the nails mostly being driven at an angle so as not to go through the planking. Five or six of these pieces were put in and the leaks stopped.

C. H. CHRISTIE, Saginaw, Mich.

Corroded Piping a Source of Trouble

THE best way to locate a leak in the hull, especially a small one, is to haul the boat out and allow the bottom to dry off. Any bilge water in the hull will tend to work out and the location of the leak or leaks will be shown by the presence of damp spots on the outside of the hull, or if the leak is sufficiently large, by the dripping of water.

The remedy depends upon the location and character of the leak. If it is a leaky seam or butt joint probably the old calking cotton will have to be pulled out and the seam re-calked.

Perhaps the edge or portion of a plank has rotted and allows the water to get through, in which case a new section of plank must be fitted.

A leak sometimes very difficult to locate and remedy is caused by teredoes eating into the planks or keel. They are very likely to enter through a seam or around nail heads and especially where a seam has opened a trifling amount, as where the stem joins the keel or along the garboard streak. If any minute holes are discovered they should be

are being burned up, is heard. If the damage is not extensive enough to require replacing the timbers, the cavities should be well dried out, then cleaned out and painted with copper paint and finally filled with cement and the outside painted.

Another kind of leak sometimes hard to locate is caused by the corrosion of the pump

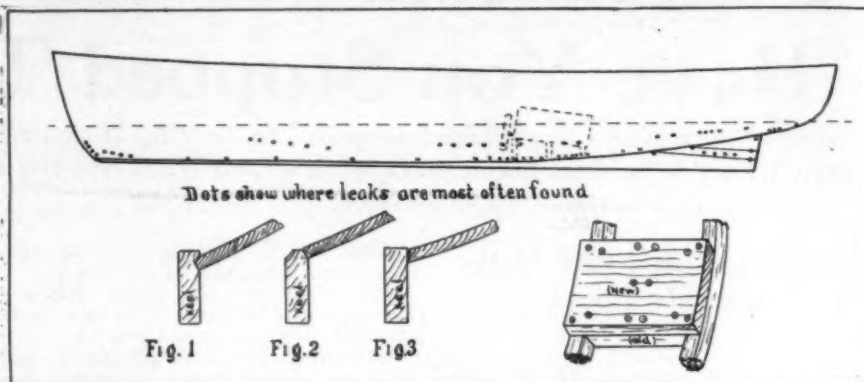


Diagram showing the various places where leaks are most liable to occur. In the three figures Mr. Murphy gives types of garboard construction, the advantages and shortcomings of which are explained in the text

dug into with a knife or chisel; sometimes the revelations due to this procedure are startling. All the "chewed up" portions of the wood must sometimes be removed to get at the leak; at any rate, even if there is no leak at present, the "worms" must be gotten at and destroyed. This is preferably done by applying a blow torch to their habitations until a cracking noise, which indicates that they

suction piping, when this is of galvanized iron. This sometimes corrodes very slowly, and minute openings are made through the pipe or fittings. These openings slowly increase in size and finally cause a bad leak. So in case of a mysterious leak it is well to go carefully over the piping.

H. H. P.,
Oakland, Cal.

Increasing the Factor of Safety

Devices That May Be Added to a Motor Boat to Protect Its Occupants from Danger—Circumventing the Bitter Fact That What's Meat for the Corinthian May Be Poison to the Landlubber

THE PRIZE CONTEST—Answers to the Second Question in the September Issue

"Safety First" Cockpit Railing

(The Prize-Winning Answer)

SOMETHING not often found on a small cruiser, but which in a great many instances would add to the operator's peace of mind, especially when women and children are aboard, is a railing around the cockpit, for with a raised self-bailing floor the height to

the top of the coaming is too low for safety. But for a small boat light railing must be used, say the $\frac{3}{8}$ - or $\frac{1}{2}$ -inch brass or galvanized pipe. However, if this is screwed together in the usual way it is very likely to break at the threaded ends, from rust or corrosion or from a sudden strain.

Following is a description of the way I got around some of these difficulties in constructing a railing for a 28-foot cruiser. When out in a storm one day a practical demonstration

was given as to the strength of these joints, for the awning frame was carried away entirely and the railing on the starboard side ($\frac{3}{8}$ pipe) was bent over double, but without breaking at any of the joints.

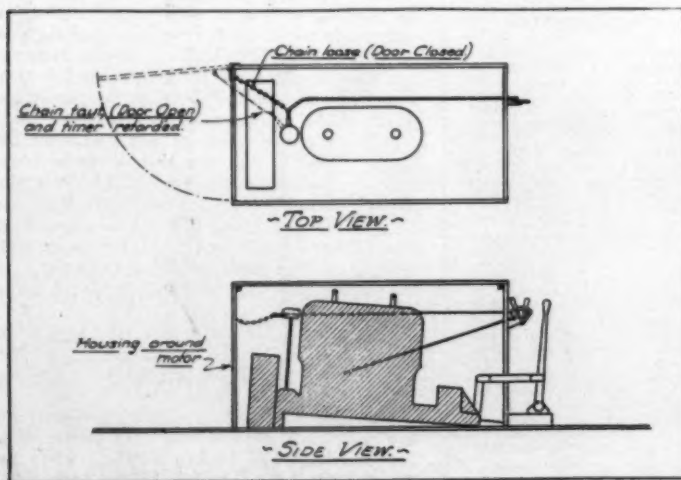
As shown in Fig. 1, a section next to the cabin bulkhead and one at the rear of the cockpit is made removable to allow passengers to come aboard. The side section is held by a union whose threads are kept

well greased to allow of easy removal by hand; at the other end a piece of steel drill rod is driven into the end of the pipe and slides into a tee.

Especially care must be taken to make all threaded joints strong. Crosses are used at the upper ends of the uprights, in order to take the ends of the removable awning frames. These crosses are bored out at the bottom to allow the upright to slip through; a tap is run through from the bottom end, and the thread at the upper end cut out enough to allow the end of the upright to be screwed in from the bottom (Fig. 4). In this way no strain is brought on the thread, and even if it should break, the fitting would not come off. The awning frame is made of the same sized pipe, with pieces of drill rod driven into the ends of the uprights (Fig. 2), which slip into the open pipe ends of railing uprights. This drill rod is very tough and is practically as hard to bend as the pipe itself.

Where threaded ends must be screwed directly into fittings, as at C, D, E (Fig. 4), an iron plug is screwed or driven into the end of the pipe (Fig. 3) so that the latter would not give way if it broke at the thread. (The tee at D is bored out to fit the pipe and is pinned to it.) Where short nipples are used, as at A, B (Fig. 4) these are made from a solid piece of iron or steel rod to prevent danger of breaking.

The railing uprights in this case are set into special sockets of cast bronze, made long with lugs at top and bottom for bolting to the coaming, and with a leg cast on (or



Mr. Motz suggests a device which protects the crew from flying oil, moving parts and back-kick

General Protection for the Crew

brace) which extends out and is fastened to deck.

If galvanized iron tees, crosses and other fittings are used these should be of malleable iron.

Referring again to the needful element of safety which such a railing introduces it should be said that it is not for the boat owner himself that one recommends such precautions, for he was born with a caul and is web-footed besides. It's for the landlubbers—bless 'em.—H. H. PARKER, Oakland, Cal.

THE sketch on page 24 shows an arrangement designed to protect the occupants of the motor boat from

- 1—Back-kick of the engine in cranking.
- 2—Injury by open gears or other moving parts.
- 3—Flying oil or grease.

The protection from flying oil or grease consists of a complete housing around the motor, the top and front of which are hinged for accessibility to the motor when cranking, priming or making other adjustments.

This housing is a wooden panel work with glass windows in the sides and front for inspection of the motor without opening up the housing doors. The rear end is a stationary bulkhead or panel upon which are mounted the controls to spark and carbureter, etc., and the rest of the housing is portable, simply being fastened to the floor and rear panel by means of brass door hooks and eyes. In this way the entire housing, with the exception of the stationary part, can be removed when necessary.

The housing, besides protecting from moving parts and splashing oil and grease, also muffles somewhat the noise of the engine. Ventilation should be pro-

vided for the inside of the housing by means of small openings in the bottom and top of the same.

It is necessary in order to crank the engine to open the forward door which is hinged on the side as shown in the drawing. A small brass chain is connected from this door to the lever on the timer so that when the door is opened the spark is automatically retarded (see sketch), making it impossible to crank the motor with an advanced spark.

To crank the engine is often a popular stunt with the guest, and I have seen at least two broken wrists resulting from sharp back-kicks, due to failure to retard the spark. With the above arrangement a back-kick is practically impossible.

W. ELMER MOTZ, Philadelphia, Pa.

A Shot in the Dark

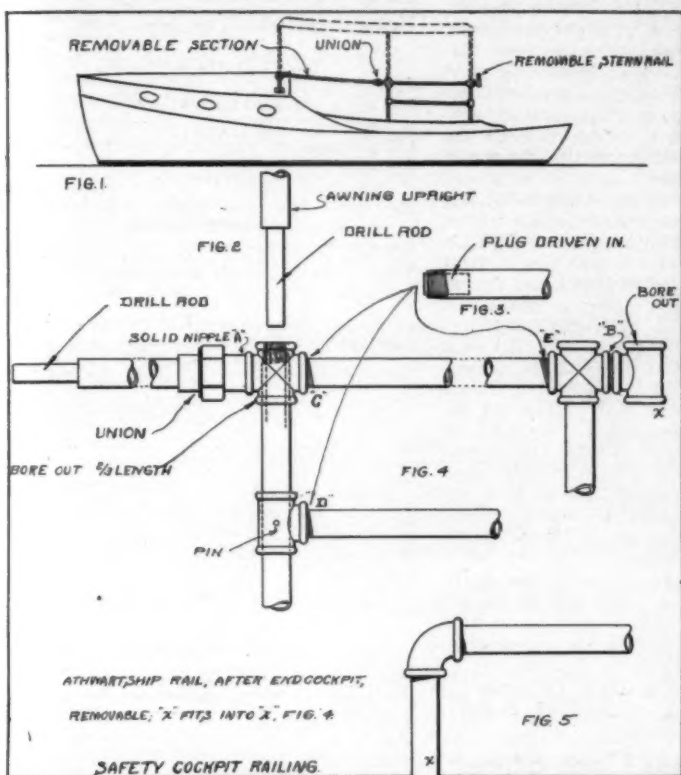
ONE of the most calamitous things which can happen aboard a boat is the loss of a man overboard at night, when charging along at full speed. Obviously, the first thing to do when a man does fall over is to throw him a life-belt. The drawback is that in slowing down and coming about, the ship is liable to lose the man in the darkness. The common solution for this is the flare-buoy.

But all yachtsmen have not the money to put into one of these, and something of this sort is needed on a good boat. Why not, therefore, use sound to guide the rescuing vessel? The suggestion is this: On a life-belt or life-ring, fasten with straps a water-proof holster containing an old revolver loaded with blank cartridges.

The immersion should not interfere with the action of the revolver, and the water will not hurt the blanks if they are grease-smear.

Of course, there is always the chance that the man would be too excited to use it, or using it, would fire all the shots at once, but if used properly the device ought to bring about a quick rescue in the darkest of nights or the thickest of fogs. The reports will carry farther than the human voice, and the revolver has the further merit that its muzzle flares will aid in guiding the searchers.

W. ALAN SCOTT, Collingswood, Ont.



A staunch life rail for the cockpit of a cruiser, is Mr. Parker's suggestion. A removable section is provided for

A Safety Gasket

THE drawings will explain fully how I overcame the danger of fires caused by the backfiring of the engine through the carbureter, as they give in detail a simple device that may be constructed in a short time by any boatman. It is worked out on the principle of the safety lamps used in coal mines, that is, that a flame will not pass through a wire gauze, owing to its being broken up into so many small parts.

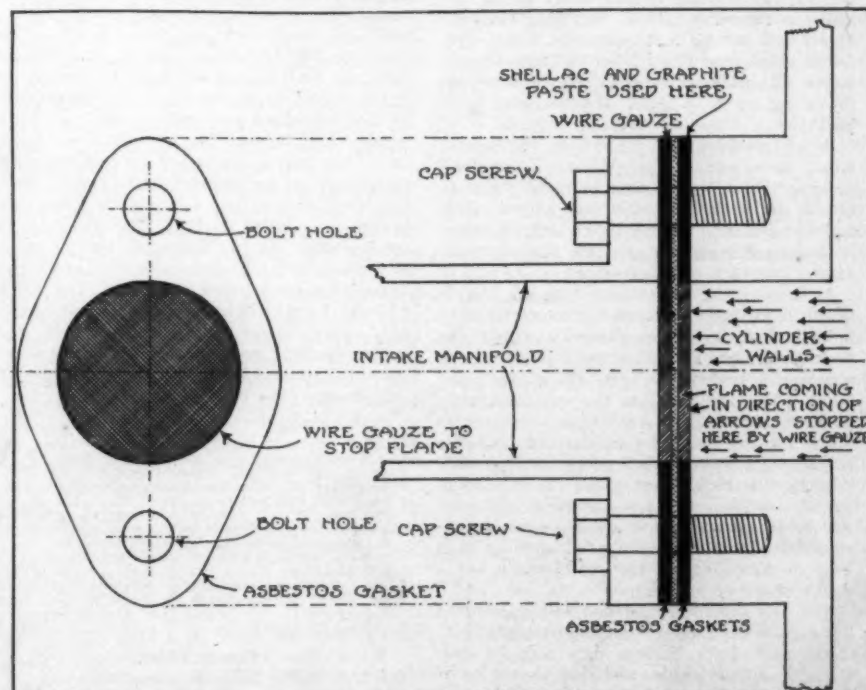
First, make two gaskets of asbestos or any other suitable material to fit the connection between the intake manifold and the cylinder, or between the carbureter and the manifold. Then cut to the overall measurements of the gaskets a piece of wire gauze of fine mesh, punching the necessary holes for the bolts.

Now they are ready for assembly. Make a thick paste of shellac and powdered graphite. Put plenty of this paste on the gaskets, then place the wire gauze between them.

The safety device is now ready to install. Having removed the gasket from the connection between the intake manifold and the cylinder, replace it with the safety gasket. The paste and the forcing of the gauze into the gasket material by tightening the bolts, make it air-tight.

I can state from experience that this device, besides preventing fires, decreases the gasoline consumption, as the charge, before entering the cylinder, is broken into very fine particles.

ALBERT T. GRAY, Dover, N. H.



A safety gasket for the elimination of back-fire. Mr. Gray asserts that its use also tends toward increased economy in fuel consumption

The \$1,000 Cruiser

An Interesting Discussion of Whether the Best Value at This Figure May Be Reached by Buying Second Hand, by Building a Boat from K. D., or by Employing the Services of Architect and Builder

THE PRIZE CONTEST—Answers to the Third Question in the September Issue

Getting the Most for Your Money

(The Prize-Winning Answer)

A SATISFACTORY thousand-dollar cruiser may be acquired in either of two ways (disregarding theft). She may be purchased ready-made or she may be built. Let us consider the former method first. In the advertising columns of MoToR Boating, cruising boats are frequently offered for sale at prices in the neighborhood of \$1,000, and if you find among them just the boat you are looking for, you will undoubtedly get more of a cruiser for your money than if you build a new boat. Stock cruisers are also advertised by some builders, although few mention the price in public. The brokers, ever obliging, will send lists of available craft for the asking, and the names and addresses of a dozen reliable yacht brokerage firms appear in each issue of this magazine. Tell them in detail what you would have and they will prove themselves energetic correspondents and perhaps will find for you the ideal cruiser. Boats up to 30 feet or more in length are frequently sold second-hand at prices not exceeding \$1,000. Then, too, we sometimes hear of wonderful bargains among the second-hand craft, but the average buyer gets in the end little more than he pays for. We should not forget to figure in alterations and renewals when considering prices asked for used boats. Also it is a mistake to buy any boat merely because she is cheap. Be certain she meets your own individual requirements.

Rather than put up with a misfit, how much better to build a smaller cruiser which will embody all those little pet notions born of experience on past cruises made in other less perfect craft. To many enthusiasts half the fun of owning a boat is in seeing her grow in the shop. Then that priceless anxious thrill as she first takes the water, and the mingled worry and bliss of the trial trip! After all, what can be better than to put the thing up to a good designer and build her!

When planning his little ship, the owner must not expect too much for his thousand dollars. He will find that he must strive to attain usefulness in hull and power plant and dispense with those things which are merely ornamental and not strictly necessary for safety, comfort or convenience.

A boat of the raised-deck type 25 feet in length is probably as large a cruiser as can be built and equipped satisfactorily within our limit of price. To obtain room in the living quarters, a beam of 7 feet will be none too much. The freeboard at the bow should be about 4 feet 6 inches, while at the transom 2 feet 4 inches should be satisfactory. A nearly plumb stem should be specified, which with a vertical transom stern gives the most boat for the money. A fair amount of deadrise will insure easy action in a seaway, while considerable flare to the forward sections will keep down the flying spray and make her a dry boat.

The hull should be fastened with galvanized boat nails since these combine strength with cheapness. Deck fittings may also be galvanized, but the rudder and skeg should be of bronze to avoid rapid deterioration through rust. The frame should be of oak with Georgia pine planking. This makes strong, durable construction—we are not seeking light-

ness. Deck trim must be of oak since mahogany is too costly.

The engine should be thoroughly dependable, with ample reserve of power to allow of stemming swiftly flowing tides and river currents and to buck head seas successfully when the occasion demands. Copper gasoline tanks should be insisted upon as galvanized tanks almost invariably give trouble through the coating flaking off and obstructing the needle valve in the carburetor.

The way in which to proportion \$1,000 is a thing scarcely any two boatmen will agree on. It would seem that \$450 for the hull, \$350 for a four-cylinder four-cycle unit power plant with cylinders about 4 x 4 inches, and the remaining \$200 for tanks, piping, ground tackle, deck equipment, toilet, Government requirements, cushions and galley outfit would be a reasonable allotment. Of course, the famous builders will not build a 25-foot cruiser hull for the above mentioned sum. There are dependable builders, however, all along the coast who will gladly contract to build a plain seaworthy little ship without equipment for \$450.

Be sure to have ample ventilation in the cabin and have your motor protected from rain and spray. A location under a bridge deck is usually satisfactory.

The owner should keep a careful eye on the work as it progresses, and in the end he will become the possessor of a very useful little cruiser built to his requirements, and fitted to his needs.

ALLAN O. GOOLD,
Portland, Maine.

An Itemized Cost Sheet

THE following figures show how I should proceed to build and equip a cruiser for \$1,000. I would prefer a 35-foot by 8-foot 3-inch beam V-transom stern model, of medium weight construction, having keel and deadwood cut from 3-inch white oak; ribs 1½ x 1½ inches, and planking ¾-inch cypress. Such a boat will be large enough for a good sized party for extended cruises, will be safe anywhere and quite speedy. In figuring the cost below I do not allow for labor, but as the boat is purchased knock-down, with every part cut to shape ready to put together, the labor of building will not be great, and building a boat is half the pleasure of owning one. In the following list all prices of fittings, etc., are taken from 1916 catalogues of well-known reliable concerns. The prices of paint, lumber, hardware, etc., are, of course, only approximate, as they will vary according to locality and the taste of the builder, yet they are ample to meet all ordinary requirements. The cost sheets follow:

Hull

One frame complete with all tool work done, every piece cut and fitted to place, ribs, stem bent, all holes bored with galvanized iron bolts and screws to fasten same, for 35 x 8-foot 3-inch raised-deck cruiser.....	\$116.40
Six hundred square feet ¾-inch cypress planking, dressed and cut to shape ready to fasten in place, complete with galvanized hardware for fastening.....	55.50
Lumber for decks and interior finishing.....	23.00
Paint, putty, varnish, canvas for decks, etc.....	16.00
Total for bare hull.....	\$212.90

Power Plant

One four-cylinder four-cycle medium-duty motor, 20-24 h.p.....	\$246.00
Magneto, reverse gear and rear starter attached, and built in as unit plant.....	133.00
Complete propeller outfit for salt water.....	35.00
	\$414.00

Steering Gear

One 25-inch polished brass steering wheel....	\$8.75
One galvanized rudder outfit for 35-foot boat....	5.50
Forty feet of ¾-inch bronze tiller line at 5½¢.....	2.20
Eight galvanized sheaves, 4½ inches, at 60¢.....	4.80
	\$21.25

Hull and Deck Fittings

Six 8-inch brass ports for cabin at \$3.50.....	\$21.00
Two 6-inch brass ports for toilet at \$2.25.....	4.50
One pair brass bow chocks.....	1.93
Two pair brass stern chocks.....	1.76
One pair brass deck plates.....	1.00
Two galvanized riding bits.....	6.60
One galvanized windlass.....	10.40
Total.....	\$47.19

Ground Tackle

One 60-pound galvanized navy anchor.....	\$5.50
One 30-pound galvanized navy anchor.....	3.35
Two hundred feet one-inch Manila rope.....	10.80
Total.....	\$19.65

Government Equipment

Four polished brass running lights.....	\$5.40
One 8-inch polished brass fog bell.....	1.25
One 24-inch polished brass fog horn.....	.60
One 8-inch electric whistle.....	4.20
Six cork life belts at 80¢.....	4.80
Two dry powder fire extinguishers at 35¢.....	.70
Total.....	\$16.95

Electric Light Outfit

One dynamo with governor pulley and automatic cut-out switch.....	\$27.00
One 6-volt 80-ampere hour storage battery.....	14.00
One voltmeter.....	2.50
One ammeter.....	2.50
Two 4-inch dome lights at \$2.00.....	4.00
One trouble lamp with extension cord.....	.60
One searchlight.....	7.50
Switches, cleats, sockets, wire, screws, etc.....	5.00
Total.....	\$63.10

Cabin Furnishings

One pump closet.....	\$20.00
One set valves and connections for closet.....	6.00
One galvanized stove containing two burners for kerosene.....	10.65
Linoleum for floor.....	6.00
Material for berths consisting of springs, mattresses, material for outer covering and hardware.....	15.00
Material for ice-box, sink, etc.....	8.00
Cabin hardware such as locks, hinges, screws, catches, etc.....	10.00
Miscellaneous furnishings, such as dishes, etc.....	10.00
Paint, putty and varnish for cabin finishing.....	8.00
Total.....	\$93.65

Miscellaneous Equipment

One mahogany binnacle with brass lamp and 3¼-inch liquid compass.....	\$12.75
Two ring lifebuoys 24-inch cork at \$1.50.....	3.00
One 4 x 6-foot yacht ensign.....	2.27
One 40-gallon galvanized gas tank.....	8.75
Ten feet copper tubing ¾-inch diameter for pipe line from tank to motor at 12¢.....	1.20
Two connectors for same at 5¢.....	.10
Two valves for same at 26¢.....	.52
One gasoline strainer.....	1.00
Material for hand rail around deck ¾-inch galvanized pipe and fittings.....	10.00
Material for awning consisting of pipe for frame, canvas, curtain fasteners, etc.....	15.00
One 9-foot tender with oars, boat hook, painter and fenders.....	50.00
Total.....	\$104.59

Total Cost

Bare hull.....	\$212.90
Power plant.....	414.00
Steering gear.....	21.25
Hull and deck fittings.....	47.19
Ground tackle.....	19.65
Government equipment.....	16.95
Electric light outfit.....	63.10
Cabin furnishings.....	93.65
Miscellaneous equipment.....	104.59
Grand Total.....	\$993.28

Freight and express charges will bring the total to approximately \$1,000, and when the boat is completed you will have a good safe craft, and one you will be proud to own.

RIFFLE COCHRAN, Ashland, Ky.

Building by the Day

ONE thousand dollars is none too much for building a satisfactory cruiser, but it is more than enough to buy one second-hand. Bargains in the way of used boats are similar to all bargains—good when they

are really good, but very bad when they are not—withal hard to find when looked for, though plentiful at other times.

Small factory-built boats of stock design may be bought new for this sum, but one loses much of the satisfaction to be derived from having a boat planned according to individual fancy in all details.

To get the best out of owning a cruiser, have it built under your own direction and observation (sharing in the work if you have the time and ability), and take an active interest in its progression.

Now as to expenses. Not to exceed the cash limit, you cannot build and equip satisfactorily anything over 30 feet, so do not aim for a grander size. As a first step, look for a good, conscientious boat-builder owning a reasonably complete equipment of tools. If he has not a shop of his own, space can be hired for the construction. Go over your ideas and plans with him, and get estimates on everything needed as dictated by his experience. Do not, however, accept his say-so blindly; freely consult literature, magazines,

ness, your hull must have a good beam to start with; after that, aim to keep all weights low and to make those above the waterline light.

If you handle the game in this way, you will get three times more fun out of it than the fellow who can afford to spend three times as much and lets someone else do his planning. I've been there and I know.

JULIAN C. SMALLWOOD, Baltimore, Md.

Purchasing Second-Hand or in Frame

TO get a cruiser for \$1,000, or even for an amount considerably less, there are several methods of procedure open to us. The size and quality of the boat we are able to get for any given amount of money depends on how we proceed. We can get a complete boat second-hand, or we can get a new boat and install a second motor, or we can get a complete new outfit.

It is easy to be badly deceived with a used boat or engine, but on the other hand, a good

\$15 to \$50 depending on the size of the boat, and at these figures anyone can afford to have a boat that has been designed by a real naval architect.

There are about a dozen firms in different parts of the country who make a specialty of knock-down boats. Such boats consist of the entire frame-work of the boat cut to shape, the frames and other parts being steam-bent where necessary, and even the bolt and screw holes being bored in some cases. These frames are very substantially made of the finest oak and other suitable woods, very often of better materials than could be gotten by a local builder. If the planking is also bought, it is of the best clear cypress or cedar, woods impossible to get at a reasonable price in many sections of the country. These boats fit together very accurately and there is very little chance of an amateur builder going wrong on them. They are usually very well designed and have good lines, and the saving in price by erecting the boat yourself often amounts to 40 or 50 per cent. of the finished value of the boat. If such a boat be bought, the item of freight and cart-



A type of cruiser which can be constructed for about \$1,000. In building or in buying a second-hand boat for this figure, the prospective owner must dispense with ornamental unnecessarys and put his money into a serviceable hull and a reliable power plant

advertisements, and other builders—in short, study each subject dealt with. Having decided the essential points, hire your boat-builder at day wages (\$3.50 to \$4.50, depending upon locality, etc.).

The writer believes that one can do better with a knock-down frame than to work from plans or otherwise. The manufacturers of such can turn out this heavy work more cheaply than the small boat-builder, and they furnish excellent lumber at a price less than can be had from most local markets. If this idea is not adopted, however, you should select a hull your boat-builder has made before, the molds, etc. being available, and the construction familiar.

The following proportions of the total expense may be kept in mind.

K. D. frame and planking.....	\$150 to \$200
Other lumber, fastenings.....	50 to 150
Labor	300 to 400
Power plant	200 to 300
Accessories, equipment	50 to 150

If the upper limits of any items are approached, economize on the others.

One may save much by careful planning and shopping for materials. For example, doors, windows, molding and sheathing, and small joined work are more cheaply made at a wood-working shop equipped with machine tools. Instead of having built-in seats in the cockpit, get three or four folding camp chairs, which are more comfortable, cheaper, and make better room. Many camping utensils such as folding cots, cook stoves, etc., are adaptable to boat use, and are inexpensive. Except when better prices may be had elsewhere, buy all your chandlery from one dealer, thereby obtaining a discount.

As to seaworthi-

outfit may often be bought very cheaply second-hand. First of all, investigate the reliability of the man or firm selling it. A second-hand hull should be taken out of the water and carefully examined. An old motor, if still in a boat, should be tried out in a long steady run, note being made of the revolutions per minute and fuel consumption and a comparison of them made with the same data in a new motor of like size and make.

The age, make and condition of a second-hand motor should be thoroughly investigated. Avoid very old engines, or engines made by small concerns or firms no longer in business. Ascertain the amount of equipment with the motor and be sure the motor, propeller and clutch are suitable for your boat. Then, have the engine taken down and inspected by a competent mechanic.

If a complete outfit is to be bought second-hand, charter it for a time first with the understanding that the charter money, or the major part of it will apply on the purchase price.

While it may cost more, a new boat will generally give greater satisfaction, and here again we have several methods of procedure open to us. The size and quality in this instance depend on how much work on it we can or will do ourselves. The boat can be bought or built to order complete ready to run, or we can get it built to order with the interior unfinished and save from 5 to 20 per cent. depending on our desire for hard work. In either event, if the boat is built by a local builder, have it done from the plans of a good naval architect. The standard architect's fee is 5 per cent. of the price of the boat, and it is a very good investment. Many builders profess to be naval architects and as such spoil many boats, not only in their looks but also in their underwater lines. If you cannot afford getting an architect to draw you specific plans, buy a set of stock plans and specifications. These range in price from

age should be given careful attention, for it is very easy to have excessive freight charges eat up the saving that would be otherwise effected by erecting such a boat.

The firms selling knock-down boats generally also sell paper patterns. These patterns, together with the instructions accompanying them, enable an amateur builder to buy the lumber and construct the entire boat himself. Another 10 per cent. saving can be easily effected in this manner but it is more than offset by the greatly increased amount of labor necessary. Then too, as in the case of the small local builder, it will be found hard to get first class lumber and hardware at reasonable prices.

It is also possible to build a creditable cruiser direct from the stock plans of a naval architect, especially if the boat be of the V-bottom type. In this type of boat, we get away from most of the steam-bending, and for this reason such a boat is probably easier to build than a round-bottom boat from pattern.

Generally speaking, it is possible to get a good 26-foot cruiser with a standard 12 or 15 h.p. motor built complete for \$1,000. With the same amount of money it can be built up to 35 feet in length buying the frame knock-down, or up to 40 feet if built from plans or paper patterns.

The prospective purchaser should remember always that he is in the market for a good serviceable craft, and not for a flimsy hull decked out prettily with a lot of gewgaws and knickknacks. A fancy scroll on the bow is all right when it is the finishing touch to a job of thoroughgoing excellence, but while it may attract the eye of the fair sex and thus seem an inducement for purchase, it's mighty little protection when the waves are straining the timbers.

FRANK J. GRUBE,
Tacoma, Wash.



A Heavy-Duty Speedway

Designed to Meet the Requirements of Cruisers and Commercial Boats of Moderate Speed—Cylinders of the L Type, Cast in Pairs with Integral Heads and Water Jackets

THE Speedway engine shown in the accompanying illustration is a heavy-duty type developing 100-115 h.p., and is designed to meet the requirements of cruisers and commercial boats of moderate speed. It is a quiet-running power plant, oil-tight, not excessive in weight, and it incorporates in its

heads and water jackets; they are of the L type, and are completely jacketed above the frame, there being no exposed portions. The frame is of cast iron in one piece, strongly

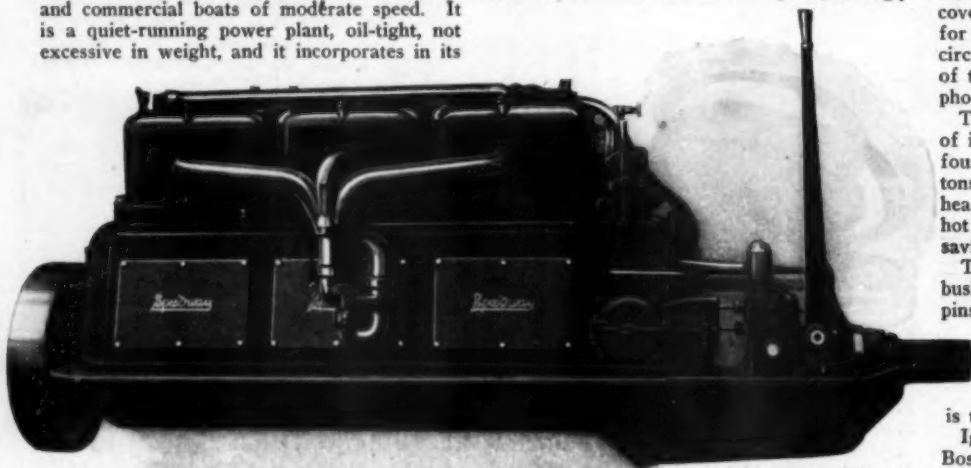
sides. The cylinder bolting flange is near the center of piston travel, thus balancing the piston side thrust in a perfect manner. On the forward end of the frame is cast a gear cover, and on the after end is an extension for carrying the air compressor, oil pump, circulating pump drive and magneto. One side of the frame is arranged to receive the phosphor bronze camshaft bearings.

The pistons are cast from a special grade of iron, are ground to size and are fitted with four spring rings. On the inside of the pistons just above the wrist pins are fitted false heads which serve to keep the oil from the hot piston heads, thus eliminating smoke and saving oil.

The upper ends of the connecting rods are bushed with bronze to receive the steel wrist pins, and on the lower ends are T heads, to which bronze babbitted crankboxes of marine type are secured by two bolts. The crankshaft is of carbon steel, $2\frac{1}{2}$ inches in diameter, and its forward end is tapered to receive the flywheel.

Ignition is by the high tension system, a Bosch ZR6 dual water-proof magneto supplying the current. The magneto is gear-driven from the camshaft.

This engine which weighs 5,000 pounds and has $6\frac{1}{4} \times 8\frac{1}{2}$ -inch cylinders, is sold with full equipment by the Gas Engine & Power Co. and Chas. L. Seabury & Co., Cons., of Morris Heights, N. Y.



The six-cylinder 100-115 h.p. Speedway motor has a one-piece iron frame of exceptional strength and stiffness

design all of the latest meritorious developments in the gasoline engine field.

The cylinders are cast in pairs with integral

webbed and exceptionally deep, thus increasing the stiffness of the engine and permitting the use of exceptionally large hand holes on both

The Galusha Gas Producer

Apparatus for Obtaining Gas from Coal, Coke or Charcoal for the Economical Operation of Regular Gasoline Engines—Consumes One Pound of Coal per Horsepower Hour

FOR the man who places economy at its true value and who is not required to restrict himself unduly on the amount of space devoted to the power plant, the Galusha gas producer manufactured by the Nelson Blower & Furnace Co., of South Boston, Mass., will commend itself. It is not, of course, adapted to the small pleasure boat, but finds its most useful field in the larger sizes of craft, both pleasure and commercial, including auxiliaries. In addition to effecting an economy in fuel cost, its use in most cases influences the insurance cost in the right direction—which is downwards.

The producer makes gas out of coal, coke or charcoal, and makes it automatically as the engine calls for it, almost precisely as the carbureter on a gasoline engine creates a gaseous vapor from gasoline. There is, however, no storage of highly inflammable fuel on hand. The producer is used in connection with the ordinary gasoline engine instead of a carbureter, and its fuel consumption is about one pound of coal per horsepower hour. Under normal conditions eight pounds of coal does

the work of a gallon of gasoline or other liquid fuel, and occupies no more space.

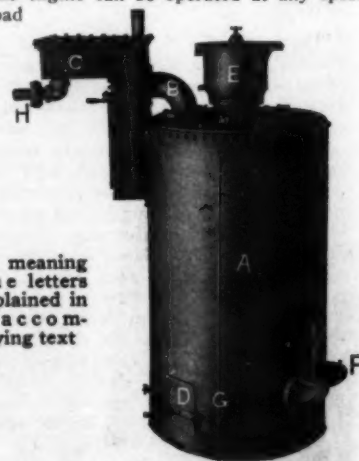
Referring to the accompanying picture of the producer with its chief parts lettered, *A* is the gas producer. It is a steel shell with fire brick lining and resembles an ordinary furnace used for heating a house. Near the bottom of *A* is a shaking grate, which carries the resemblance to the furnace still further. *G* is the handle by which the grate is shaken to remove the ashes from the fire into the ashpit in the bottom. *F* is the air intake to the ashpit, and *D* is the ashpit door.

The furnace or producer is filled about once in four hours, the fuel being put in through the coal hopper *E*, without interference with the operation of the producer and engine.

The products of combustion, which would in the ordinary furnace, be smoke, are here in the form of a gas, and this leaves *A* through the pipe elbow *B*. The gas is cooled, washed, cleaned and dried in the scrubber and purifier *C*. The dry, clean and perfect gas goes from *C* to the engine through the pipe *H*.

The speed and power of the engine, as well

as the manufacture of the gas, are entirely controlled by a throttle valve at the engine, and the engine can be operated at any speed and load



The meaning of the letters is explained in the accompanying text

from overload and maximum speed down to "dead slow" and no load at all.

The makers claim that there is no deposit of carbon in the engine cylinders, and that igniter points have to be cleaned only about one-third as many times as when the best grade of gasoline is used. The producer gives excellent results in connection with heavy-duty four-cycle gas and gasoline engines.

The advantages of using a Galusha gas producer in place of steam are many and obvious. In the first place no water is needed, and in the second there are no steam boilers or pipes to explode or leak, while the plant weighs

about one-quarter as much as a Scotch marine boiler of the same power. Incidentally, it occupies about one-third of the cubic feet of space taken up by a water tube boiler. In case of accident causing a break in the producer or the pipes the machinery automatically stops, so that there is no possibility of danger from this source.

Of interest also is the fact that the Galusha may be used on a gasoline engine in connection with other fuels, and the change from one to the other can be made without stopping the motor. The producer fire will keep for days without attention, and the "stand-

over" fuel consumption is stated to be from one-seventh to one-ninth that of steam boilers.

Apparatus of this type is made in power ratings from 18 up to 250 h.p., and it has given excellent results when connected to Wolverine, Automatic, Murray & Tregurtha, Buffalo, Standard and many other different makes of marine motors.

This American-built producer, in commercial use since 1907, is working not only in the United States, but in Norway, Holland, France, Mexico, Central America, South America, etc., and even as far distant as Australia, where it is in government service.

The Fay & Bowen Big Six

Perfect Balance of All Moving Parts One of the Leading Features of This Four-Cycle Power Plant—A Motor Which Has Achieved Its Meed of Fame in Express Cruiser Racing

PROMINENT among the four-cycle marine motors of to-day which are giving solid satisfaction to many boat owners and are, in addition, capturing many prizes in express cruiser competition, are those manufactured by the Fay & Bowen Engine Co., of Geneva, N. Y. The Fay & Bowen four-cycle line comprises models ranging in power from 22 h.p. up to 75 h.p. in four- and six-cylinder sizes. The "big six," shown in the accompanying illustration, is the engine which made such a good reputation for itself in Bittersweet and other express cruisers of her class, while a four-cylinder motor of this type drove the 40-footer Helma to victory against thirteen other boats in the race for the Kendrick trophy shortly before the close of the season.

Special attention is directed by the makers to the clean design of their motors, and to the fact that all of the various auxiliary parts, such as the magneto, the lubricator and the water pump, have been actually designed into the motor and not bolted on here and there as afterthoughts. The driving mechanism of all these parts is enclosed and the drives are positive.

Another and most important particular is the balancing of all reciprocating parts. In the old days of gasoline engine construction the pioneers trusted largely to the weight of the flywheel to cover up the inequalities of torque caused by unbalanced parts, and the speed of the early motors was not so great as to make vibration a serious fault. Better might it be said that with the one-cylinder type of motor the whole cycle of operation was just one immense vibration after another, and that with the numerous faults which needed correction

the perfection of true balance was a small detail. But engineering has advanced in the last twenty or twenty-five years, and nowadays the elimination of vibration is considered one of the primary essentials. With the lightly built hulls in which the fast turning engines are installed, a well-balanced job is absolutely necessary, and so it is that in the construction of Fay & Bowen engines the flywheels and crankshaft are carefully and accurately balanced by the latest methods. Likewise the pistons and connecting rods are separately matched for weight, and all propeller wheels furnished as part of the equipment of these engines are balanced for weight and pitch.

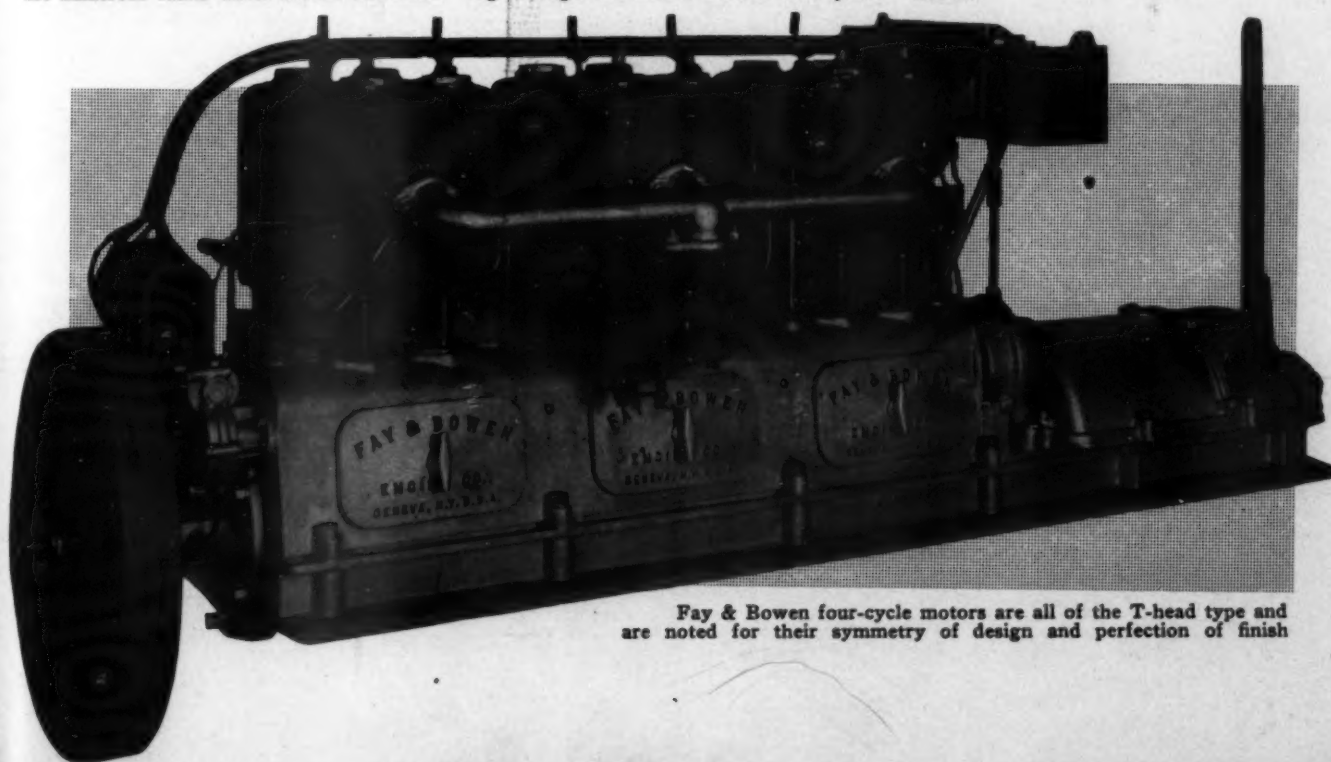
In the design of the cylinders the T-head type is followed, giving plenty of room for valves of liberal diameter without skimping on the thickness of the water jackets. The material used in the construction of the cylinders is semi-steel of the finest quality, and they are cast in pairs with the heads integral. The water jackets have been made with as much length as was possible so as to keep the engine cool and thus indirectly eliminate the necessity of frequent valve-grinding and other troubles. The inner surfaces of the cylinders are finished to within one half of one thousandth of an inch, and, owing to the minimum expansion of semi-steel under heat, it has been possible to fit the pistons with great accuracy.

The pistons themselves are cast from the same mixture which goes into the manufacture of the cylinder castings, and they are of liberal length to provide a large bearing surface. Oil grooves are cut so that the lubricant is collected from the cylinder walls, and, passing through the hollow carbon steel piston

pin, is fed to the upper connecting rod bearing. This bearing is of the highest grade of phosphor bronze, as this metal is considered superior to white metal at this point because of its greater resistance to the shocks of explosion. On the other hand, the lower end bearing is of the best grade of white metal, for at this point it is friction wear and not explosion shock which must be considered.

The main crankshaft bearings are located in bearing heads let into the ends of the crankcase castings and bolted securely in place. The bearings are extra long and the crankshaft turns in thick bushings of the best white metal. The forward bearing head is amply large to allow of installation and removal of the crankshaft, and has an oil duct which carries back into the crankcase any oil which otherwise might leak out and be scattered about.

For general lubrication two methods are combined—force feed lubrication to all cylinders and main bearings through a gear-driven independent sight-feed lubricator, with splash feed lubrication in the crankcase. Crankpin lubrication, which is of primary importance, is further assured by providing pick-up tubes on the caps of the connecting rods. The internal arrangement of the crankcase is such as to return to its proper place any oil which may work astern because of the engine's being placed at an angle in the boat. The entire lubricating system is automatic and is stated to be one of the most thorough ever applied to an engine. Except where the factor of light weight does not enter into a purchaser's calculations, the crankcase furnished is of aluminum.



Fay & Bowen four-cycle motors are all of the T-head type and are noted for their symmetry of design and perfection of finish

Helpful Hints for Motor Boatmen

Five Reasons for Overheating

AN overheated motor may be due to one of the following:

1. Deficient water circulation.
2. Water jacket clogged with scale or sediment.
3. Lack of proper lubrication.
4. Excessive motor speed.
5. Use of a low grade of gasoline,

or a combination of any or all of the above.

Deficient water circulation may be caused by a leak in the intake pipe to the pump. A leak at this place will not show itself by dripping, but will break the vacuum in the intake pipe, thus cutting down or stopping altogether the water supply. Worn packing in a plunger pump and worn gears in a gear pump will also reduce the water supply and can be remedied by replacing the worn parts. After launching my boat, the engine, brand new, heated up considerably on the trial trip and upon inspection it was found that the seat of a ball-check valve had been bored a trifle too large, allowing the ball to stick in the opening, thus reducing the flow of cooling water. A copper washer or burr was forced into the valve, and, having a hole slightly smaller than the original seat, has worked satisfactorily for six years. In another instance my motor heated up and upon taking apart a ball check

valve, a splinter of wood was found wedged in the seat, preventing the closing of the valve. An intake strainer was then applied and prevented the recurrence of the trouble.

Accumulation of sediment or scale in the piping will often cause enough resistance to the passage of water to reduce the quantity considerably. Taking down the piping and cleaning or replacing it will right matters.

Boats operating in shallow or silt-laden waters often collect enough sediment in the water jacket to cut down the cooling surface exposed to the water, with an overheated motor as the result. Frequent flushing out the jacket with water from some source of pressure will tend to reduce this trouble.

A heavy deposit of scale and sediment, however, cannot be removed this way. If such exists remove as much as possible by poking steel wires through all the openings available, and, after plugging all except the top opening, fill with a solution of fluorhydric acid (about 2 or 3 per cent.) and let stand for three hours. This will dissolve and loosen all scale and sediment, but the acid must be neutralized by washing out the jacket with lime water after the sediment has been removed. After drying thoroughly, fill the jacket with paint, drain and let dry with all

connections left off. No more rust or scale will form in a jacket treated in this way.

Lack of oil will cause excessive friction between piston and cylinder walls, resulting in a hot cylinder. Keeping a steady watch on the oil drips or, better still, putting one-half pint of oil to each five gallons of fuel in the tank will, if your engine is a two-cycle machine, prevent the trouble.

Pumps, especially plunger pumps, are designed for the normal speed of the engine on which they are installed. Quite often running the engine above the stated revolutions will cause a decided drop in the efficiency of the pump, due to the high velocities of water through the ports and piping of the circulating system. Thus the water supply, in relation to the engine revolutions, is reduced, and heating results.

The present low grades of gasoline produce more heat units per charge than the higher grades. A small quantity of water introduced into the manifold ahead of the carbureter (the proper amount can be determined by trial) will reduce the temperature and at the same time lessen the carbonization due to low grades of fuel. This will also prevent pre-ignition.

W. E. M., Philadelphia. Pa.

Caring for an Outboard Motor

THE tremendous advance that has been made in the outboard motor business in the last two years or so has brought many out-door lovers into the motor boat game and, with all due respect, there is probably no machine on the face of the globe that stands the rough handling that many outboard motor owners give their power plants. It is not that the owners are careless, but that they have had no experience, in a great many cases, with marine power plants. The following suggestions for the care of outboard motors were gleaned from the note book of a neophyte operator of a single-cylinder machine:

Short circuiting of plug from spray—A piece of rubber hose of the proper size slipped over the plug and terminal solved this trouble. Regular covers are provided by dealers if a somewhat better device is wanted.

Do not lean on tiller, as the arm is not made strong enough to stand this strain. If the motor is used for livery purposes or by several inexperienced people, it will be well to cut the tiller and rivet a piece of heavy spring brass over the cut. This spring will

allow considerable give to the arm, without any danger of breakage occurring.

If the motor is not equipped with a drain cock for the cooling water, one should be tapped in, as the water should be drained off each time the motor is put away. Failure to attend to this causes the jackets (which are very light in any case) to corrode, and in case of cold weather coming along the jackets will burst if frozen.

Operators are often bothered by leakage of gasoline through the vent hole in the tank when the motor is stored in any position except that of vertical. If you will provide a wooden plug that can be forced in the hole it will end this trouble. A better way is to have the hole tapped for a machine screw that has had a thumb piece brazed on. Keep this screw hanging by a cord near the opening and screw it down every time you lay the motor up.

It is bad policy to leave the motor hanging on the stern of your boat for any great length of time. It strains the boat and causes the

motor to be subject to damage from other boats that are making landings.

When putting the motor away in the boat house, do not lay it on the floor of the locker. There is danger of bending some of the piping. Have a stand made and hang it up.

If you have had any trouble in starting the motor, and find that it often requires spinning, you can remove the handle and have a spool similar to the ones on small steering wheels fastened to the top of the crank shaft. Have a stout leather strap made about one inch wide and wind this several times about the spool, catching one end beneath a turn. By pulling sharply on this strap you will find that the motor will start more easily, and without the slightest danger of a back kick. As the handle has been removed, there is no danger of its catching and injuring the operator. A disappearing handle such as there are on many heavy-duty motors will get rid of the standing handle, but it will require more work and considerable expense and will not be any better than the strap and spool.

G. T. W., New York City.

Points for the Boat Buyer

THE purchase of a boat, either new or second-hand, resolves itself into a study of the following features of the proposition:

Adaptability as to design and general arrangement.

Hull construction.

Engine and machinery equipment.

The suitability of the boat offered for the service intended is largely a function of the seating arrangement, the location of the engine and the style and arrangement of the lockers. The hull should have full bow lines for general service, the stern should be broad to prevent squatting when under way, the engine should be preferably located forward under a hatch, but if located amidships should be housed to prevent the occupants being injured from moving parts. The lockers should be broad and should be floored and sealed to form a smooth surface admitting of easy stowage. A tool locker, oil and lamp locker, ice locker, life preserver locker, and lockers for general purposes should be provided, it being remembered that in an open boat the lockers must house many things to keep them out of the weather. The

lockers should be so constructed as to prevent rain water from entering, for in a rain squall the lockers of an open boat are the only protection. The cockpit should be free from exposed exhaust piping and muffler.

In judging a hull the materials and their fastenings should be considered. The best construction provides white oak frame, keel, keelson, floor timbers, deck beams and carlins with white oak shear and garboard planks and white cedar planking. Cypress is next to cedar or juniper but is considered inferior to the latter owing to the fact that it absorbs large quantities of water, making a boat logy. If the materials are good we should next look to the fastenings, preference being given to copper fastenings riveted over copper burrs. The rudder should extend well into the boat and should be provided with a stuffing box. The rudder stock should terminate in a quadrant. The skeg, rudder and rudder stock should be of bronze for salt water service. The deck fittings should be of ample size and should be bolted in place. Well braced bits should be provided at the bow and stern.

The engine should be gone over to determine

its accessibility and general condition, particularly noting the compression, the pump, the ignition device and the general appearance of the nuts and bolts which are indicators of age and troubles. The action of the reverse gear should be accorded special attention. Careful note should be taken as to provision being made for the removal of each part of the equipment without disturbing others. The gasoline tank and its accessibility for removal should be noted. In looking over the shaft log remember that an outside bearing and inside stuffing box made up on a piece of brass pipe form the ideal installation. The style and method of securing the propeller should be noted, it being remembered that a propeller should be bored, taper secured from turning by a key and from dropping off by nut and cross key.

Finally, when buying a boat, take a boat-wise friend along on the ground that two heads and two pairs of eyes are better than one and then make sure if you buy with an idea to making radical changes that the space is available.

D. G. S., Norfolk, Va.



This department of MoToR Boating is maintained for the purpose of giving its readers opportunity to ask questions, reply to other correspondents' communications, and submit ideas, suggestions, opinions or experiences which may be of interest and assistance to motor boatmen. There are no rules governing the department other than that postage must be enclosed when an answer by mail is desired, and that the name and address of the writer must be given in each instance. No anonymous contributions will be considered for publication, but initials or a pseudonym will be substituted for the writer's own name if the request be made. The editor does not, of course, hold himself responsible for statements made or opinions expressed by contributors to this department.

MOTOR BOATING READERS

A Speed Problem

To the Editor of MoToR Boating:

I have noticed several times in MoToR Boating in reference to mile trials of speed boats that the average speed is determined by the Admiralty method of average of averages, instead of the ordinary average of the various runs.

Will you be kind enough to explain why your method gives nearer the true speed of the boat than the simple method of taking the average of the four or six runs, as the case may be, does?

J. K., Jersey City, N. J.

The usual practice is to run the boat on a measured-mile course. Two pairs of points are placed exactly a nautical mile (6,080 feet) apart, and the ship's course is steered at right angles. The time of transit is taken by a stopwatch. In order to eliminate the effect of tide, several runs are taken both with and against the tide, and the "mean of means" is taken. Thus, suppose a vessel has four runs, and the speeds observed are 15.13, 14.61, 15.66, 14.11 knots, respectively. Then the "mean of means" is obtained as follows:

Speeds	First Means x 2.	Second Means x 4.	Mean of Means x 8.
15.13	29.74	60.01	120.05
14.61	30.27	60.04	
15.66	30.27	60.04	
14.11	29.77	60.04	

The true mean speed is therefore $120.05 \div 8 = 15.006$ knots. The ordinary mean of the speeds is 14.88 knots. The same result as the mean of means is obtained by multiplying by 1, 3, 3, 1 and dividing by 8.

The above is based on the theory that the speed of tide can be expressed as a quadratic function of the time. That is, if y is speed of tide, then

$$y = a_0 + a_1t + a_2t^2$$

t being the time
 a_0, a_1, a_2 being constants

Therefore, when

$t=0$, the speed of the tide, $y_0=a_0$
 $t=t$, the speed of the tide, $y_t=a_0+a_1t+a_2t^2$
 $t=2t$, the speed of the tide, $y_{2t}=a_0+2a_1t+4a_2t^2$
 $t=3t$, the speed of the tide, $y_{3t}=a_0+3a_1t+9a_2t^2$

If V is the true speed of the boat, then owing to the tide, the speed at intervals of t up and down the mile will be

$(V+y_0), (V-y_0), (V+y_t), (V-y_t),$
or a mean of means of

$$V + \frac{1}{8} [3(y_t - y_0) - (y_{2t} - y_{3t})]$$

By substituting in the above values for y_t , etc., this is seen to be equal to V .

If six runs are taken up and down, the mean of means is obtained by multiplying by 1, 5, 10, 10, 5, 1 and dividing by 32, and it is easily shown that if the tide be assumed a cubic function of the time, the "mean of means" at equal intervals of time gives the true mean speed.

Rudder Design

ALTHOUGH it is apparent to all that the important guiding tails will be found interesting it will be noticed that with the many types of vessels there has been developed a rudder best suited to each particular class.

The function of the rudder is to shove the stern to one side so that the bow will point in another direction. This action can only be accomplished by the rudder being put at an angle to the keel line so that the water coming into contact with it may offer resistance to its passage; the resistance is really a pressure delivered tangentially to the stern in a direction according to the angle of the rudder, and the value or amount of that pressure is directly proportional to the area, its angle, and the speed at which it meets the water.

The following example will illustrate what an important bearing the rudder has on the speed of a boat; with a rudder having two and one-half square feet upon a boat running at different speeds—say 15 and 30 knots.

The pressure of water against the rudder at any angle and speed is calculated from the maximum resistance, which is, of course, with the rudder at right angles to the keel line.

The formula is:

$$1.12 \times \text{Area of rudder in sq. feet} \times \frac{11}{10}$$

speed in feet per second = Pressure in lbs.

Therefore at 15 knots we have a pressure of:

$$1.12 \times 2.5 \times \frac{11}{10} \times 25.3 = 78 \text{ lbs.}$$

and as explained that the resistance at any angle varies as the speed, the pressure at 30 knots will be 156 pounds.

To ascertain the resistance for any position of the rudder, multiply the obtained maximum resistance by the sine of the angle of the rudder.

As a suitable rudder will never require to be put over more than 45 degrees, and as the sine of that angle is 0.7, the resistance when "hard over" against the stopper, with which all rudders should be provided, will be 54.6 pounds at 15 knots and 110 pounds at 30 knots. So much, then, for the speed deterring influence of a hard-over helm.

With a perfect rudder, one in which the form has been determined by the characteristics of the boat it is to steer, or maintain an even course under normal conditions, it will seldom be necessary for the rudder to be put over more than 5 degrees for a single-screw boat, and less for a twin-screw one; and as the sine of 5 degrees is 0.08, the maximum intermittent running resistance will be $6\frac{1}{4}$ pounds at 15 knots and $12\frac{1}{2}$ pounds at 30 knots.

The resistance must obviously be taken up in the rudder head at the point where the quadrant or tiller is coupled to it, and the pressure to be resisted determines the strength of the rudder head.

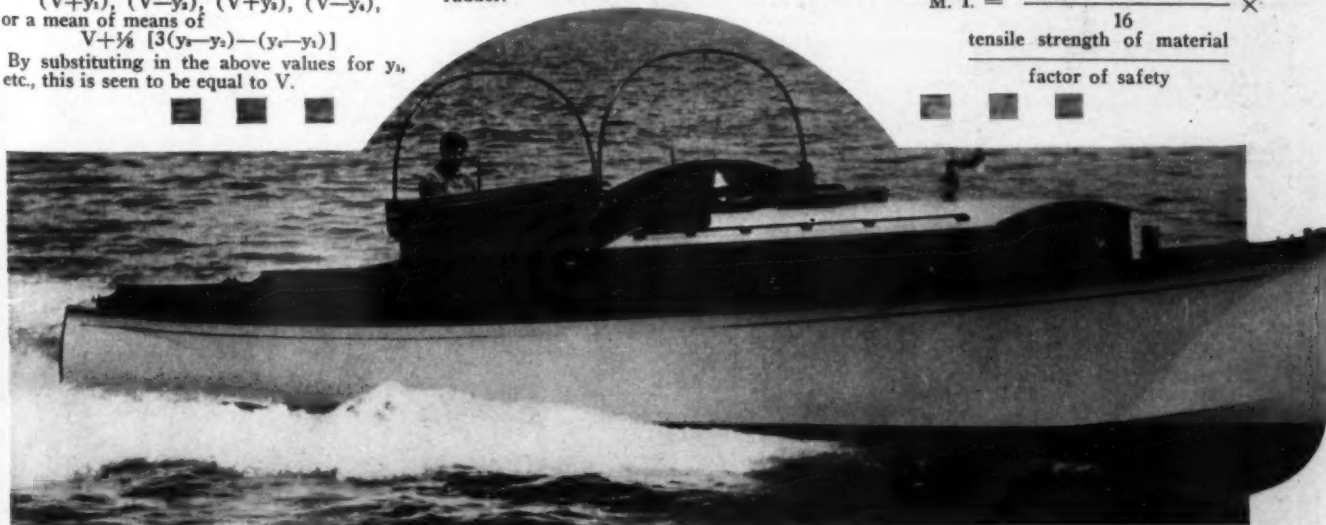
This power is the pressure multiplied by its "lever," the term lever being applied to the distance between the Center of Effort of the rudder and the center of the rudder stock. For all practical purposes the longitudinal Center of Gravity of the immersed area may be taken, for although the C. of G. is a little farther aft than the C. of E., the slight error is on the safe side.

This lever in inches, multiplied by the pressure in pounds, gives the moment to be resisted in inch-pounds, and that product may be brought to inch-tons by the divisor 2,240.

We shall assume our lever to be 15 inches, and as all calculations for strength must be based upon the maximum resistance, we must consider the boat at the highest speed with the rudder hard over, that is, at 45 degrees; therefore, the moment to be resisted will be $156 \times 15 = 2,340$ inch-pounds, or one ton and 100 pounds, and the rudder head must be made strong enough to resist that strain without "giving."

This not only determines the strength of the rudder, but the power required to operate it, and is also its Moment of Inertia; then if the rudder stock be of the usual circular section;

$$M. I. = \frac{3.1416 \times \text{dia. of stock}^4}{16} \times \frac{\text{tensile strength of material}}{\text{factor of safety}}$$



Lydia, a Hand V-bottom express cruiser similar to Countess. She is 40 feet in length and is powered with a six-cylinder Van Blerck which gives a speed of 23 m.p.h. Joseph Shattuck, of New York and Chatham, Mass., is her owner

and assuming manganese bronze to be the material used, a tensile strength of 60,000 lbs. per sq. in. of section, and a factor of safety of 6, a transposition of the preceding formula to obtain the diameter of the rudder stock and head at its smallest part will be:

moment to be resisted $\times 16$

$$\frac{3.1416 \times 60,000}{6}$$

the cube root of which gives the diameter.

Taking the latter first, we have

$$\sqrt[3]{\frac{2.340 \times 16}{3.1416 \times 10,000}} = 1.06 \text{ inches dia. of stock,}$$

$$\frac{3.1416 \times 1.06}{16} \times 10,000 = 2,340 \text{ lbs.,}$$

which corresponds to the one ton and 100 pounds, pressure and strength already deduced if the diameter of the stock be worked out to a thousandth part of an inch. As 1-inch diameter is too small, the size selected would be 1 1/16 inch.

We can now ascertain the net horsepower necessary to put the rudder to any angle in any given time, and for example will say hard over (45 degrees) in three seconds.

As the unit of work is the foot-pound and 1 h.p. equals 33,000 foot-pounds per minute or 550 foot-pounds per second, then the power required will be:

$$\frac{\text{moment to be resisted}}{\text{unit of work per sec.} \times \text{time in sec.}} =$$

$$\frac{2,340}{550 \times 3} = 1.4 \text{ (say } 1\frac{1}{2} \text{ h.p.)}$$

The final calculation is the size of the flexible wire rope between the wheel drum and the rudder quadrant, and as the safe working load for these small ropes is one-fourth the breaking strength of seven tons for a rope two inches in circumference, it is apparent that by adopting a rope of this size we have one strong enough to take a strain up to 1 ton + 15 cwt., giving a margin of reserve strength of 14 hundredweight above normal requirements.

An ample margin should always be allowed for the super-normal strains to which all rudders are subject by reason of slackness or striking floating obstructions, and it is worth noting that important races are frequently lost owing to failure of the steering gear.

Stretching screws should be fitted so as to take up the slack as it occurs. Chain should never be used in any part of a small boat's steering gear, as the links "serve" badly round the wheel drum and the fairleads.

WILLIAM C. DAVIDS.

A Propeller Problem

To the Editor of MoToR Boating:

Having bought a second-hand engine for my cabin cruiser, I am writing in hope that you can give me advice as to the size and pitch of propeller to use. The boat is 30 x 8 feet with transom stern, is a good cruising model, light in weight, and should make medium speeds handily. The engine is a 22 h.p., three-cylinder, two-cycle, and turns 500 r.p.m. This engine has a governor which will not let it turn over

any faster than that, so in order to make the motor develop its full rated horsepower the propeller must be of a large enough size to load the engine to its limit. Otherwise it would simply use less kerosene and not develop its full rated horsepower. As this is a heavy engine, using a cheap fuel, I wish to make it work to its full capacity and get all the speed that I can. I now get an average of 7 miles an hour with a 7 h.p. engine, turning a 16 x 18-inch propeller 700 r.p.m. This will give you an idea of the boat. What size and pitch propeller would you advise using with the larger engine? Further, I notice that there seem to be two types of propellers, those with round or egg-shaped blades, and those with triangular blades, having the widest part near the center end—which type is best suited to my needs, viz., cruising with the above mentioned engine?

J. B., West Park, N. Y.

[The proper propeller for your 30 x 6-foot cruiser, powered with a 22 h.p. motor, turning 500 r.p.m., should be one having three elliptical shaped blades, 25 inches in diameter by 26 inches pitch. This should give you a speed of between 9 1/2 and 10 miles an hour if your motor develops the power which you state it does, and is able to turn this wheel 500 r.p.m.]

M. V. P. B. A. States Its Position

[We take pleasure in publishing below a letter recently received from W. V. Kidder, Secretary of the Mississippi Valley Power Boat Association, in which Mr. Kidder sheds more light on a statement recently made by him in one of our western contemporaries. This letter is in reply to a communication of A. L. Judson, President of the American Power Boat Association which appeared in our August issue, and we deem it only fair to print it, although the bone of contention has been removed by Miss Minneapolis having already raced for and won the Gold Cup at Detroit.]

Mr. Kidder's views on the subject of racing for cash prizes will also be of interest to our readers, although they don't accord with our own. It seems inevitable that if motor boat racing were generally conducted on a cash basis it would eventually deprive the game of every element of sportsmanship. If the cash prizes were enticing enough it would create a body of professional racers who entered the events solely for the money that there was in them and with not the least thought for the sport itself. Secondly it would promote commercialism, and we should soon see the various boat and engine manufacturers entering their craft and competing not for titles but against each other—not for the promotion of the sport, but for advertising purposes.

For a time this condition would, no doubt, bring about an acceleration in the development of the ultimate perfect craft and power plant, but in the end it would itself defeat this object and write the finish of motor boat racing. Every manufacturer would like to see his product win in events of national importance, but not one is desirous of being rated second, third or fourth best.

It is necessary to go no further afield than the history of automobile racing in this country to appreciate the truth of these remarks. When the motor car was in its infancy men with sporting blood in their veins took it up, and to their interest in this new expression of sport was due in no small measure the phenomenal advancement of the automobile. In the course of time, however, the professional class grew up, and as no amateur likes to compete with men who make a business of racing (or baseball or golf or any other sport), the men who had been in it for the fun of the thing and for the sport's sake dropped out and left the racers for cash to fight the thing out for themselves. This was, of course, of advantage to the professional race drivers, and as the purses grew larger and the competition between the various makes of cars became keener, it was for a time beneficial to the manufacturers themselves. It finally developed, however, that motor car racing became a matter not of fighting a game fight for the honor there was in it with the loser congratulating the winner, but a bitter contest in the amassing of money and advertising slogans. We now see the sport (if it can be called that) rapidly on the wane because the motor car manufacturers who in the last few years have governed its destinies do not care to have their cars branded as

second best, and, not feeling sure of their ability to achieve first, drop out. In the \$2,000,000 motor speedway at Sheepshead Bay, we have eloquent testimony to this fact. Built primarily to stage the country's greatest racing events it has since its completion a year ago, seen three or four motor car contests, a few manufacturers' experiments, a policemen's field day, and a wild west show. Commercialism has dug its own grave with barely enough profits to pay the undertaker.—EDITOR.]

MR. KIDDER'S LETTER

"I notice that you have published in your issue of September, a letter addressed to me by President Judson of the American Power Boat Association. Inasmuch as my original comment was wrongly interpreted by Mr. Judson as 'unfair and unfriendly,' and as your comment indicates that you construe it as a reflection upon the sincerity of the executives of the A. P. B. A., it would seem only fair, both to Mr. Judson and to the officers of the Mississippi Valley Boat Association, that a brief statement of the circumstances inspiring this comment, be published also.

"I believe no one who knows Mr. Judson and the writer will question our sincerity or honesty of purpose in working unselfishly for the advancement of the sport of motor boating. It would be most unfortunate, therefore, if any misconceptions should be entertained by anyone as to our mutual desire at any and all times to do and say only those things which are, ultimately, for the good of the game. It is unnecessary for me to say that I regard Mr. Judson, and all of the others who are active in the American Power Boat Association, as gentlemen of the highest character and purpose. In fact, I have been in the 'boat game' for a good many years, and I have yet to find a genuine 'boat bug' who is not whole-souled, generous and just—the sort of duck you can bank on—for if we stop to analyze, it's love of nature that makes boat bugs, and the man who is capable of loving nature is not likely to be unfair or unfriendly to his fellow man.

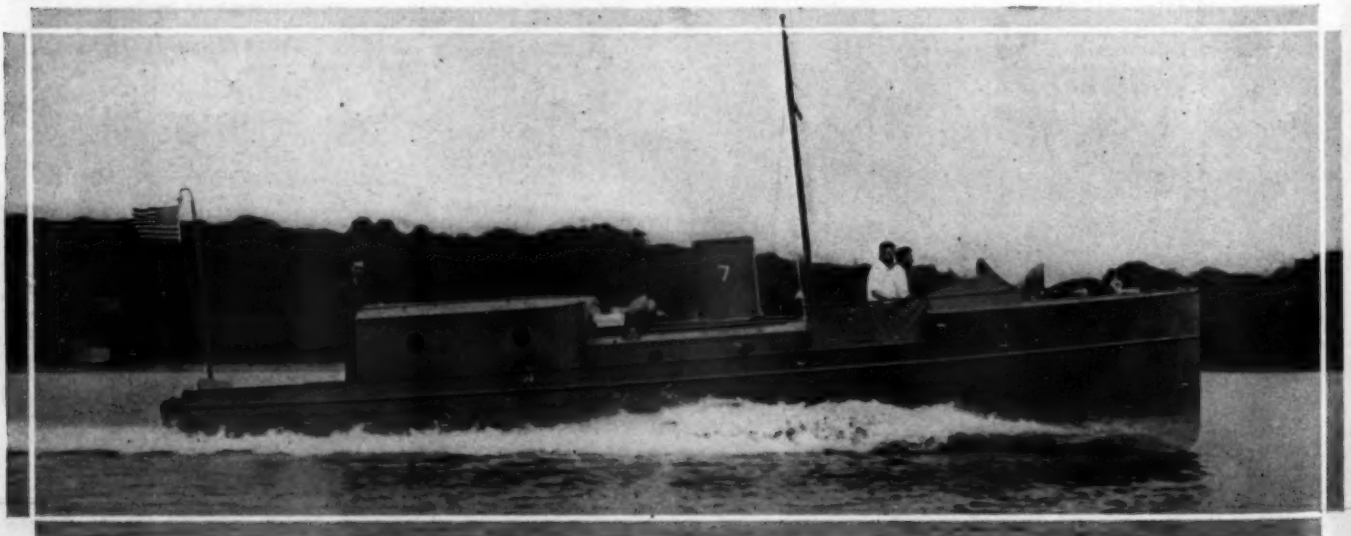
"During the annual regatta of the Mississippi Valley Power Boat Association at St. Paul in July the report was general and seemingly well grounded that Miss Minneapolis would not be allowed to race for the Gold Cup, because money prizes were given in our races. The same rule seemed to threaten Commodore Pugh's Disturber IV. Mr. Judson had written at least two owners, prior to our regatta, advising them of the A. P. B. A. rule barring boats and drivers competing in races for cash prizes. These letters, too, seem to have been misinterpreted and construed to mean the A. P. B. A. would bar out any boats which had participated in the M. V. P. B. A. regatta, where money prizes were given, even though cash purses were withdrawn at the last moment in the events in which Miss Minneapolis actually participated.

"Miss Minneapolis was built by popular subscription. Her success meant a great deal to her owners and to the boat game in the Middle West, where more like her will, without doubt, be built and raced another season. It appeared to the writer little short of crime should this boat, or Commodore Pugh's Disturber IV—the two fastest in the world to date—be deprived of the right to compete in the Gold Cup races, which we all regard as one of the world's classics, on some sort of technicality, regardless of whether or not their past performance conflicted in some slight degree with any set of rules.

"It was, therefore, with the purpose of bringing this situation to the attention of the boating fraternity, and without the slightest thought of reflecting upon the motives of any of the officials of the American Power Boat Association, that the comment was made. It now develops that Miss Minneapolis is not considered to have infringed any rules, but even had she done so I rather question whether barring her from the Gold Cup races, even with the high purpose of maintaining this rule, would have been conducive to the building of more world champions or would have served to promote the boat game. Invariably where cash purses are given and accepted the money goes toward paying a small percentage of the cost of the boat, and, particularly in the smaller class races, where it is not a 'sport of millionaires,' but rather the recreation of the ordinary and fast-multiplying 'boat bug,' this becomes an important incentive. In my opinion there is little to be feared in the menace of 'professionalism,' for boat racing is not a money-making occupation at any stage of the game.

"I have had considerable correspondence with Mr. Judson on this subject and I think he will tell you that the misunderstandings have been entirely cleared up, to mutual satisfaction.

"Yours very truly,
(Signed) "M. V. Kidder,
Secretary, M. V. P. B. A."



No. 7 of the Patrol Squadron headed by Commander Stuart Davis. She is owned by Philip Hartt, who was able to be present during the first four days of the recent naval maneuvers of the Newport District fleet

AMONG THE CLUBS

Ketewomoke Yacht Club Events

At the annual meeting of the Ketewomoke Yacht Club, Huntington, L. I., the following officers were elected for the following year: Commodore, A. E. Kouwenhoven; vice-commodore, Frank H. Johnson; rear commodore, B. G. Sammis; treasurer, Z. J. Carl; secretary, H. A. Roselle; assistant secretary, August H. Galow.

Sunnyside, Jr., Makes Remarkable Record

Sunnyside Jr., designed and built by Clifford Hadley, of Ozone Park L. I., has come through the season with seven first prizes in seven starts. This boat measures 16 feet 6½ inches in length by 3 feet 10 inches beam on the waterline, and is powered with a Roberts 3-M, three-cylinder two-cycle stock motor.

Mr. Hadley's record is as follows:

Date	Club Holding Race	Finish
June 10	Canarsie Y. C.	First
July 9	Bergen Beach Y. C.	First
July 23	Motor Boat Club of J. B.	First
July 30	Tamaqua Y. C.	First
Aug. 20	Old Mill Y. C.	First
Aug. 27	Jamaica Bay Y. C.	First
Sept. 3	Sea Gull Y. C.	First

Plans for Third Annual Miami Races Announced

Carl G. Fisher, chairman of the Regatta Committee, has announced the dates and arrangements for the Annual Southern Regatta to be held over Miami's famous motor boat race course. The dates selected for the 1917 series races are a month earlier than those of last winter.

The races will be for express cruisers under 60 feet in length, propelled by internal combustion engines, whose total piston displacement does not exceed 3,200 cubic inches.

An express cruiser is defined as a motor boat with permanent berths, fixed and sanitary plumbing, cooking arrangement and outfit for living aboard. It must have a cabin, not glass, entirely closed in, and either flush deck or self-bailing cockpit.

The cabin is to have a space under the carlins and above the frames and floor timbers equal in height to 12½ per cent. of the overall length of the boat, up to 6 feet—this space to extend for at least one-sixth of the waterline length and at least one-fourth of the maximum beam, and may be occupied by engine, cabin floor, berths or other equipment or construction.

The fuel is to be carried in fixed tank or tanks and full equipment as required by law, and effective ground tackle is to be carried in races.

THURSDAY, JANUARY 18. 2 P. M.—Open displacement boats. Distance 15 miles. No handicap. Qualifying speed 20 miles per hour.

2:45 P. M.—Express cruisers. Distance 10 miles. No handicap. Qualifying speed 20 miles per hour.

3:30 P. M.—Aquaplanes.

FRIDAY, JANUARY 19. 2 P. M.—Open Displacement boats. Distance 10 miles. No handicap. Qualifying speed 20 miles per hour.

2:45 P. M.—Express cruisers. Distance 15 miles. No handicap. Qualifying speed 20 miles per hour.

3:30 P. M.—Aquaplanes.

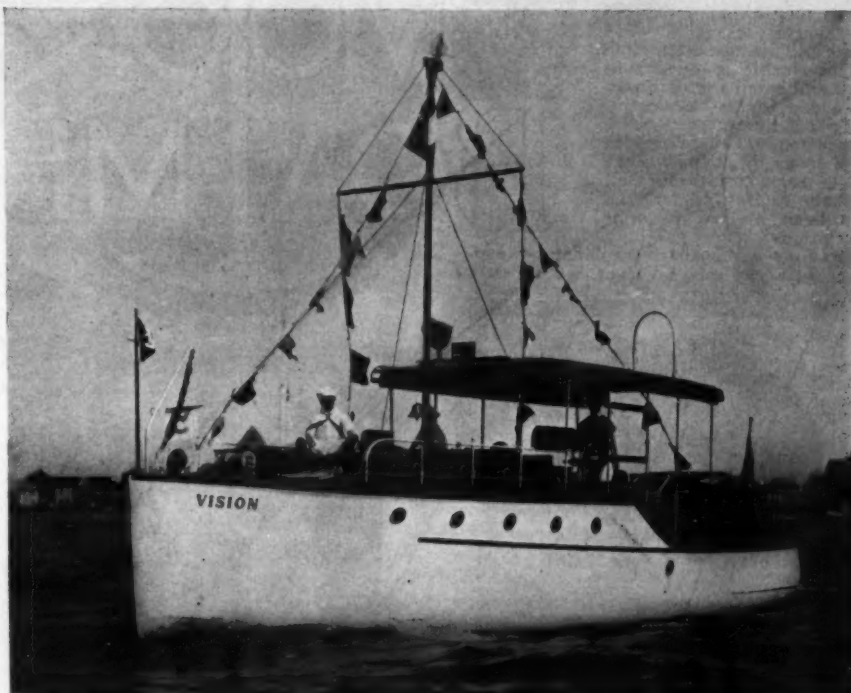
SATURDAY, JANUARY 20. 1:30 P. M.—Open Displacement boats. Distance 20 miles. No handicap. Qualifying speed 20 miles per hour.

2:30 P. M.—Express cruisers. Distance 20 miles. No handicap. Qualifying speed 20 miles per hour.

3:15 P. M.—Aquaplanes.

Long Distance Ocean Races for Express Cruisers

Saturday, January 27, 9 A. M., Miami to Key West (161 miles); Saturday, February 3, 9 A. M., Miami to Palm Beach Pier Head (65 miles); Saturday, February 10, 9 A. M., Palm Beach Pier Head to B. B. Yacht Club (65 miles); Saturday, February 17, 9 A. M., Miami to Gun Key Light and return (110 miles); Saturday, February 24, 9 A. M., Key West to Miami (161 miles).



Vision, first in her class at the Seaside Park Y. C. (N. J.) Regatta. She is owned by Commodore George Irving Merrill and is powered with a two-cylinder 6 x 7½-inch Buffalo

Safety First Federation Acts

The Safety-First Federation of America has become interested in the protection of life and property afloat and is about to launch a campaign to interest the yacht and motor boat clubs of the country in their work. The clubs have been invited to join the Safety First Federation and assist in a campaign of education which will be undertaken this winter. The following list of Safety First hints for yachtsmen has been issued:

Before leaving your moorings always be certain that

- 1—Your boat is in a seaworthy condition.
- 2—Your anchor is on board and available for use.
- 3—Your anchor cable is of sufficient length, coiled, and will run free when needed.
- 4—Your running gear is free.
- 5—Your fire extinguisher is filled and where you can get at it quickly.
- 6—Your life preservers are in good condition and that you have enough on board.
- 7—Your lights are filled and trimmed or your batteries in good order.
- 8—Your compass is compensated.
- 9—Your fog horn and bell are where you can get at them.
- 10—Your tender has at least one pair of good oars.
- 11—If you carry no tender make sure that you have oars on board.

If you have a motor boat in addition to the above:

- 1—Be sure your gasoline tank is filled and
- 2—that it is equipped with a vent or fusible plug.
- 3—If you must smoke, go out on the stern deck; in any event, don't drop sparks or matches in the bilge.
- 4—Don't try to fill your gasoline tank by the light of a lantern. Do it by day.

An Acknowledgment to the United States Power Squadrons

Doubtless many members of the U. S. P. S. as they have cruised their boats over strange waters this summer have felt as I have felt a definite sense of gratitude for the knowledge and resultant security in navigating my boat due to the influence on me of that organization.

Six years ago I entered the motor boat game and I confess that for several years I thought that the sum and substance of the game was to paint the boat, grease the motor, take on gasoline and supplies, run between the black and red buoys and keep out of the way of the big steamers. That is literally true and it is not necessary to mention the long list of the things I did not know.

Then came the Power Squadron movement and I saw a few of the examination questions in one of the magazines. This brought me to a realization of the many things I should know and I commenced to prepare myself and to urge others to join the organization.

It is simply impossible for me to express the pride and satisfaction that I feel now when cruising in home or strange waters to positively know my right of way, to understand the whistle signals of steam vessels, whether they are directed to me or other vessels, to know what tack the sailing vessels are on and see if they take advantage of their rights of way, to be greeted and welcomed by men and boats strange to me, but flying the Squadron Ensign, to observe the etiquette with my flags and to watch the way other yachtsmen care for their colors, to make sure that my lights are burning where and when they should, and above all to enjoy that wonderful satisfaction of laying a course, allowing for errors and running straight into the harbor thirty miles away, especially if the weather is foggy or too hazy to make up distant headlands or lighthouses.

Therefore it is with a true sense of my obligation that I write this acknowledgment of my gratitude for what has been done in my chosen sport for me by the influence of the United States Power Squadrons.

A. B. BENNETT, JR.,
Potomac River Power Squadron.

Big Times at Maumee River Y. C.

The Maumee River Yacht Club, of Toledo, O., contrives to keep things stirring in a social way from one season's end to the other. One of the biggest events of this year was the clam-bake held on Delaware Island. A "big top" was erected to shelter the 300 diners from the weather, and there were five other smaller tents for the cookery and for certain of the officials of the club. The concrete blocks which were built for last year's bake were utilized again, and the affair went off in slam bang style, with everybody getting more than enough to eat. Shadows of the coming annual Rat Fest are already being cast across the horizon, and the committee which has the success of this February event in hand is sure that it will be more of an occasion than ever before.

New Things For

[Each month many new parts, attachments and fittings, interesting and invaluable to owners of large and small motor boats, are added to the devices already on the market. Announcements of these articles come to us in such numbers that in order to introduce all of them to our readers we have been obliged to omit descriptions and publish only illustrations with short explanatory captions. In doing this, however, we urgently

MOTOR BOATMEN

invite our readers to write us for complete information, as we shall take the greatest pleasure in providing it together with the manufacturers' names and addresses. Do not hesitate to ask us, as we have made special arrangements to take care of this branch of our correspondence and are able to give you accurate information with the greatest promptness.—Editor.



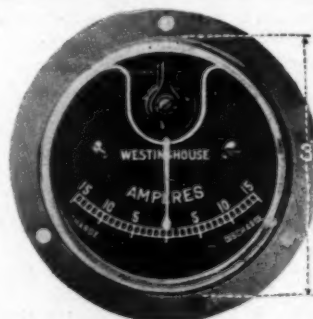
A new starter coil for use with magneto systems which is designed to give a shower of sparks



A spring nut lock which holds the nut securely in place and yet is easily removed



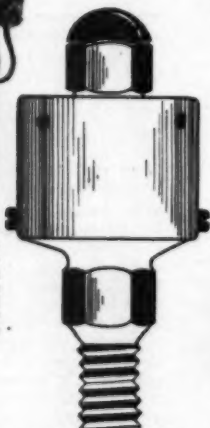
Complete outfit for machine shop use in welding and cutting metals and in decarbonizing engine cylinders



A new ammeter with two-inch dial which embodies the latest principles of design



A radio receiving telephone, which is stated to excel all others for long distance receiving



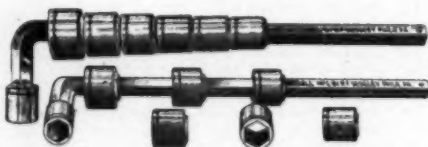
A stationary electrode for make and break engines, suitable for use with heavy marine and stationary engines



A new spark intensifier, which, it is said, will cause the most badly sooted spark plug to fire with the utmost efficiency



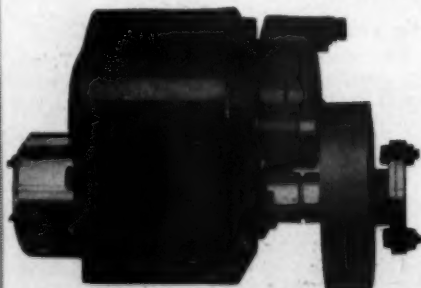
A plug which has a disc at the lower end of its center electrode, permitting sparking around its entire circumference



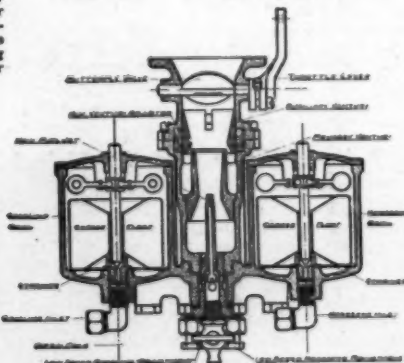
A socket wrench set which sells for \$1.50. It has seven sockets (5/16-5/8 inch) made from bar steel, case hardened



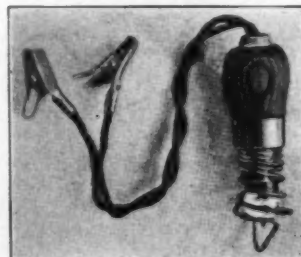
A safety set screw, which is said to lock positively and be twice as strong as the ordinary type



A new automatic magneto, designed to prevent back-kick and give an unusually hot spark at low speed



Sectional view of a kerosene carburetor, which is declared to convert heavy fuels into dry explosive gas with unusual success



A handy device designed for use in testing out the magneto or the spark plugs of a motor

Do not fail to write to the editor if you desire information concerning any of the above new things

Yard and Shop

Submarine Almost Turns the Tables

When the Massachusetts division of the civilians' motor boat fleet, which participated in the recent naval maneuvers, started its work, the intention was, among other things, to locate the submarines and "destroy" them. One of the craft, however, was nearly destroyed by a submarine, and would actually have been, it is said, except for the sterling performance of the Sterling engine with which she is powered. The boat is Whew, owned by E. Sohler Welch and Francis C. Welch, of Boston, and she acted as flagship of the fourth group of boats operating in that district.

One day while the fleet was deployed for hunting the elusive sub, Whew tried to cover one of them which had submerged a short time before. So nicely did Captain Welch calculate the position of the underwater fighter that when she came up for a breath of fresh air Whew was almost upon her. At this exciting moment the boat was reversed so abruptly that she almost stood on end, and the submarine's periscope missed, almost by inches, taking the bottom out of the surface craft. Had the reverse failed under the sudden strain Whew might now be resting her bones in Davy Jones' locker, and had the engine stalled under the suddenly applied load, the result would have been the same. As it was, however, the Sterling came through the incident covered with glory and the crew of Whew with a few beads of perspiration on their brows.

Two-Passenger Deering Hydro

The Deering Boat Mfg. Co., of Madison, Wis., has designed for Kenneth D. Clark, of Chicago, Ill., a two-passenger inboard motor hydroplane which is expected to give eminent satisfaction. This craft will be powered with a French motor of about 40 h.p. and will be of the automobile control type. A feature which is de-



A Portuguese boat powered with a two-cylinder 8 h.p. Ferro. She is used on the coast of Portugal, sometimes in very rough seas, and for the last twenty-two months has averaged 120 miles a month. Francisco Bacelar & Co. are the owners of Maria Amalia.

clared to make for speed in this boat is the Deering non-gyro propeller—a wheel of original construction which maintains the same pitch ratio throughout the entire length of the blades. With this design it is said that the slippage is so reduced that the wheel works at about 87 per cent. The estimate is made that with this wheel the engine and the monoplane construction of the boat, a speed of 32 m.p.h. will be attained, which is surprising, considering that the cost of the outfit has been kept very low.

Mab, an Attractive Runabout

One of the boats shown in the accompanying illustrations is Mab, a 30-foot runabout, built from the copyrighted designs of Elliot N. Burwell, of Boston, Mass. She is owned by Dr. W. M. Conant and has been in use during the past season at his summer home near Wolfeboro, N. H. Powered with a four-cylinder 20 h.p. motor, Mab makes a neat speed of 14 m.p.h., and the designer states that with a 35 h.p. motor a hull of this type is capable of 17 m.p.h. for a ten-hour run. The boat is of oak construction practically throughout, and its principal dimensions are: length, 30 feet; beam, 5 feet 7 inches and hull draft, 12 inches, with a total draft of 1 foot 9 inches.

H. W. Johns-Manville Co. Opens New Branch

The H. W. Johns-Manville Co. has just opened a new branch office at Great Falls, Mont., on the fourth floor of the Ford Bldg., Room 418, in charge of J. H. Roe. With the opening of the Great Falls office the Johns-Manville Co. increases its number of branches to fifty-five.

This new branch is made necessary by rapidly increasing business in this territory. Great Falls, with its population of 38,000, is not only one of the greatest hydro power centers of the United States, almost rivaling Niagara Falls, but is known as one of the best wheat growing sections in the country—its wheat taking first prize at the Panama-Pacific Exposition.

Captures Second Leg on Harbeck Cup

The annual race for the Harbeck Cup was run at Spring Lake, Mich., recently and won by L. W. Welch in his 26-foot Hacker-designed runabout. Mr. Welch's craft is a wave-collector, built by the Valley Boat Co., and powered with a four-cylinder 5½ x 6¼-inch Sterling motor. In outracing his competitors, some of whom had three and four times the power of his craft, Mr. Welch won the second leg on the cup and was so satisfied with the showing made by his boat and engine that he is confident that he can do the same thing next year. This 26-footer with its two-year-old motor did the trick at a consistent 36 m.p.h.

City of Chicago Favors Anderson

In addition to the two gasoline tugs which were built by the City of Chicago several years ago and powered with Anderson engines, a third has just been made part of the Anderson family by the installation of a four-cylinder 9½ x 11 in the 48-foot harbor boat No. 11. This engine is now in operation and has given the same satisfaction that characterized the performance of the earlier installations. It is equipped with an air starter of Anderson make which adds materially to the efficiency of the outfit. This engine is one of the most powerful of its kind in Chicago, and is certainly putting in some good strong arguments for gasoline.

Section E, U. S. C. P., Issued

The United States Coast & Geodetic Survey has recently issued Section E of the U. S. Coast Pilot, covering the Gulf of Mexico from Key West to the Rio Grande. This volume is published in octavo form and replaces Part VIII, being largely rewritten from new data. Its scope has been considerably extended, especially for the introduction of information useful to the owners of motor craft. While matter of this sort is included for all navigable waters, special attention is called to the data relating to inland waterways, pp. 30-32, inland waterways of Louisiana, page 120, and the inside route, Galveston to Corpus Christi, page 146. Complete meteorological tables for the district are also included, while a table of the largest dry docks and marine railways and tables of courses and distances are very valuable additions. The Department informs us that no effort has been spared to make Section E a useful aid to the Coast charts.

H. & N. Carburetor Co. Buys New Plant

The natural development and increase in sales of its automatic gasoline and kerosene carburetors has forced the H. & N. Co. to join the rapidly increasing family of motor and accessory manufacturers in Long Island City. Hitherto the company had operated a completely equipped plant in New York, but the increased volume of sales had made it necessary to have some of their work done outside, which resulted in unavoidable delays for the company's customers. The company will maintain and enlarge its service station at 38 West Sixty-second St., but the main office and sales department was removed from 1790 to 1675 Broadway on October 1. The H. & N. carburetor has been favorably

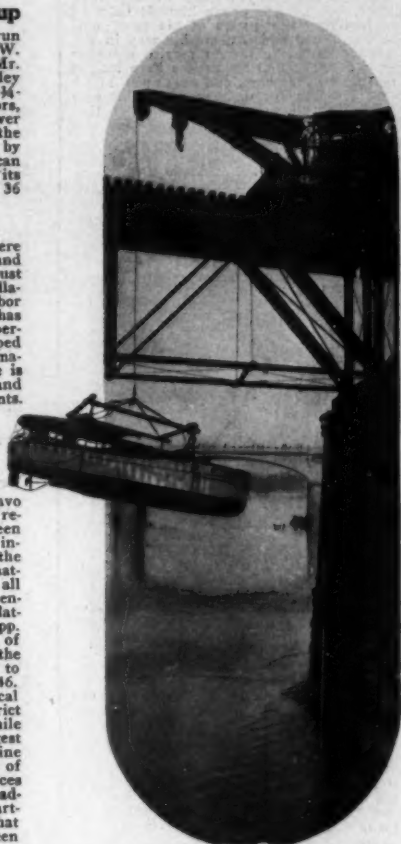
known for a matter of five years, but its leap into general favor is reported to be a matter of comparatively recent occurrence.

McQuay-Norris News

Frank J. Stanley, who has been traveling on the Pacific Coast for the McQuay-Norris Mfg. Co., of St. Louis, Mo., has been transferred to Cincinnati, O., as manager of the company's branch in that city. John Frier, M.E., and Max S. Jones, M.E., have joined the sales force of this concern in the field and will travel out of the home office.

New Bosch Contracts

The Bosch Magneto Co., of New York City, has recently entered into contracts for the supply of ignition and other electrical apparatus to three prominent concerns in the marine field. These are the Auto Engine Works, of St. Paul, Minn., the Caille



A Spectacular Launching

Most boats are lowered into the water, but few are let down by a crane from a bridge 60 feet high. The boat shown is a 36-foot V-bottom Pullman express cruiser built by the Great Lakes Boat Bldg. Corp. for J. C. Wright, of Roanoke, Ala. It is powered with a 50 h.p. Sterling and in five months cruised 4,000 miles.

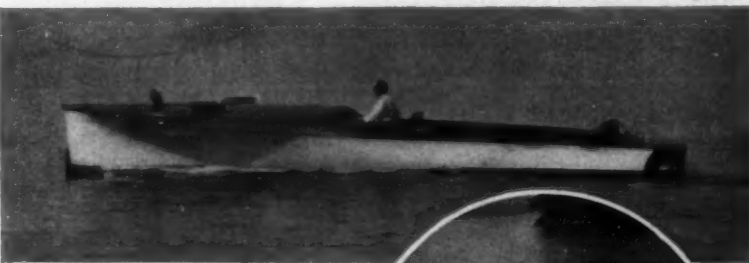
Perfection Motor Co., of Detroit, Mich., and the Regal Gasoline Engine Co., of Coldwater, Mich.

Special Kermath Announcement

We have been asked by the Kermath Mfg. Co., of Detroit, Mich., to announce that all orders that come in for Kermath engines from this time on will be filled with the latest 1917 engines. All three models in this line—the 12, the 16 and the 20 h.p. machines—are ready in the 1917 types, both as separate engines and as unit power plants. We are informed that several nice little details have been worked into the manufacture of these new power plants.

Engine Company Changes Hands

Notice was recently given that the stock control of the Hitchcock Gas Engine Co., of Bridgeport, Conn., has passed into the hands of the Standard Oil Engine Co., Inc., of the same city, the latter concern continuing the business of the Hitchcock company and assuming its financial obligations.



Mab, a 30-foot runabout built from plans of E. N. Burwell. She is owned by Dr. W. M. Conant, of Wolfeboro, N. H.



Personalities

Sterling Has New Advertising Manager

A. J. Mitchell has just been appointed advertising manager of the Sterling Engine Co., of Buffalo, N. Y., and his many friends in the trade are confident that he will prove himself fully as capable of handling the duties of his new position as he was those which came his way in the Sterling service department. As service manager for six years, Mr. Mitchell acquired a keen insight into the marine engine game, and developed, moreover, a natural talent for diplomacy. In his new field we wish him all success and feel sure that the high standard of Sterling advertising copy will be fully maintained.

Burnham Goes to Gray

R. Bradford Burnham, whose articles on cruising and kindred subjects have done much to boost the sport, and who has been known to the trade for the past two years as advertising manager of the Sterling Engine Co., recently accepted a position with the Gray Motor Co., of Detroit, Mich., as advertising manager and marine sales manager. To readers of MoToR Boating Mr. Burnham is best remembered as the skipper of *Querida II*, the 25-footer whose adventures en route to Florida were recounted in these pages some three or four years ago. Even before that five-month cruise Mr. Burnham had been a devotee of the small boat, and his sympathies have since been firmly linked with the motor boat bug of average means but abundant enthusiasm and energy.

As a result of his cruising experience he can authoritatively talk boats and waterways to any man hailing from St. John, N. B., to Key West, Fla., while he has a breadth of vision and depth of originality which have long shown themselves in his advertising copy. Mr. Burnham is to be congratulated for having come into a field which is close to his heart, and the Gray Company for having secured the services of one who knows the many sides of the marine game and loves it.



Charles B. Page

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Charles B. Page Resigns

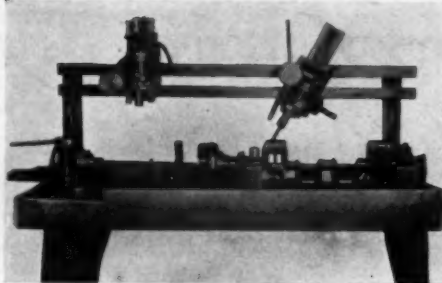
The announcement of the resignation of Chas. B. Page, vice-president and general manager of the Van Blerck Motor Co., of Monroe, Mich., comes as a distinct surprise to the marine trade. Mr. Page has been connected with the industry for so long that it is hard to think of him as not a part of it. In the old days his name was linked with the Oriole and the Globe engines; subsequently he became domestic marine sales manager for the Ferro Machine & Foundry Co., and for the last three years he has been connected with Joe Van Blerck. The wonderful resource and enthusiasm of Mr. Page have done much in raising the Van Blerck Company from a small organization, employing about twenty-five men, doing an annual business of about \$50,000 to one which is rated at nearly the million mark. The work of Mr. Page has helped to popularize the high-powered, high-priced type of motor on which the Van Blerck Company specializes. We reckon it a loss to the general industry to have Mr. Page leave it for other fields of endeavor, but he naturally knows his own interests best, and we can but wish him the very best of success in his new undertaking.

Durkee Representative on the Move

J. M. Keely, who for the last four years has successfully represented Chas. D. Durkee & Co., in the South, with headquarters at Tampa, Fla., left New York, on October 1 to visit the Pacific Coast trade. Not only is Mr. Keely a salesman of unusual ability, but he is generally known as a "prince of good fellows."



Poppy was built in Toledo, O., and has cruised from there to New York, to Florida, to New Orleans and up the Mississippi back to Toledo. Her Scripps power plant has also sent her up to Georgian Bay and the Straits of Mackinac



Drilling machine used at the plant of the Sterling Engine Co. for boring oil leads in the crankshafts of the Model F motors

If any conclusions can be drawn from past experiences, he will return from his first trip to the Coast with hundreds of new friends added to his already lengthy roster of customers. Mr. Keely's headquarters will be at The Butler, Seattle, Wash., and letters and telegrams sent to him there will be forwarded to wherever he may be.

Van Blerck Motors for 1917

The Van Blerck Motor Co., of Monroe, Mich., recently issued a bulletin showing the list prices covering Van Blerck motors for the season of 1917, and since the first of October orders received at the factory have been going through for the new line. All 1917 models will be equipped with an improved cooling device for the lubricating oil, and a new type of water circulating pump will be installed. An enclosed flywheel and many small refinements will add to the perfection of this line. The 6x6-inch size will hereafter be designated by the letter J.

Miller Engine Co. to Build Addition

The Miller Gas & Vacuum Engine Co., of Chicago, Ill., has recently taken an order from abroad for cylinder Miller motors of various sizes. A general increase in domestic business and unusually good prospects for the coming season have made it necessary for this concern to increase its capacity 50 per cent. The contract for an additional building has just been let.

A Much-Traveled Papaver

If we were a horticultural magazine we'd include the scientific name every time we happened to mention a flower, but as we're not we can only do it occasionally — when the dictionary is handy.

Now, Poppy (*papaver*) whose portrait is shown on this page is a much-traveled boat of the genus cruiser. She grew to maturity in the yards of the May Boat Works at Toledo, and she has been seen in New York waters, and she has pushed aside the water hyacinths of the St. Johns. By the time she reached Florida she was so fond of traveling that she skirted the Gulf Coast and proceeded up the Mississippi to her home port of Toledo. And then, not content with all that traveling, her owner, William G. France, of the France Stone Co., put on a few bottles of ginger ale and a few gallons of gas and headed her north in August to explore the waters of Georgian Bay and the Straits of Mackinac. From all this you will deduce that Poppy, which is a 55 x 12-foot bridge-deck cruiser, must have a motor concealed somewhere about her person — and your deductions will prove correct, for it's a six-cylinder 5½ x 6-inch Scripps complete with a Leece-Neville elec-

tric starting and lighting system. This outfit gives a speed of 12 miles an hour, and whenever the veteran engine man, Bill Cranston, of Toledo, thinks of all the happy hours that Poppy has put behind her, he's glad that he was responsible for the Scripps.

Edward vom Hofe & Co. Move

Edward vom Hofe & Co., the well-known tackle house, have moved into their new building at 112 Fulton street, N. Y. C., where there is ample room for the manufacture of tackle. This brings the salesrooms nearer to Broadway than they were at 95 Fulton street, and makes them more accessible for the average man. The rapid growth of this business necessitated new quarters, and Mr. vom Hofe is to be congratulated for the excellent location he has chosen.

Deering Hydroplane in K-D

The Deering Boat Mfg. Co., of Madison, Wis., which has had great success in the production of its outboard motor hydroplane and which has hitherto followed the Ford policy of specializing on one model, is departing from it to the extent of furnishing the hydroplane in knock-down form. Mr. Deering has spent a great deal of thought on this new plan, and it is said that he has devised a knock-down hull which can be put together by any amateur in from one and a half to three days. The boat will be delivered in three pieces. It is apparent that the simple operation of screwing the sides to the bottom is one well within the capabilities of the average man, while the deck is easily fitted together and the coaming all ready to be put in place. The finished product is a hydroplane fitted for the in-board or out-board motor and of good speed and unusual safety. In addition to the K-D form, the Deering Company is putting out paper patterns for this boat. These will particularly appeal to the amateur, as no steam is necessary in the construction of this hydro.



Messrs. Ruse and White, of Southport, Fla., went out with their Evinrude motor for to fish. They Evinruded and fished and came back with this catch of forty-four black bass, weighing eighty-five pounds

New Marine Engine Device

The Marvel Mfg. Co., of 1020 Washington Blvd., Oak Park, Ill., although a manufacturer of automobile accessories, has patented a device known as the Marvel Spark Plug Intensifier which is of particular interest to the motor boatman. It consists of a heavy glass cylinder which insulates two metal caps through which two screws are adjusted so as to form a spark gap.



A 30-foot Palmer-built raised-deck cruiser owned by C. Irving Washburn, of the Colonial Y. C. She is powered with a four-cylinder, four-cycle 20-30 h.p. Frisbie motor, and makes 8½ miles

The whole device is easily and quickly attached to any spark plug, and the current in leaping across the open space between the screws will not, according to the laws of electricity, seek for a ground, but will find an outlet at the point of least resistance, which is at the point of the spark plug. The manufacturers declare that by this device the current is so intensified that it will fire any plug, regardless of how much carbon or oil may be thereon, besides preventing carbon from forming on the cylinders and plugs. As the Intensifier is of glass, the spark is always visible, enabling the operator to see at a glance how each plug is firing.

The Evapco Gas Saver

In our September issue on the New Things page, we illustrated the Evapco Gas Saver, a device made by the Evapco Mfg. Co., of 429 Grand River Ave., Detroit, Mich. This device attracted considerable attention, and we are now informed by the manufacturers that its interest for the boat owner lies not only in the fact that it effects an economy in fuel consumption, but that it reduces the formation of carbon on the cylinders and plugs and increases power and speed. The Evapco is constructed entirely of metal and is said to equal in longevity any marine motor. It operates automatically, and as the motor speeds up admits the necessary additional air for high speed, while remaining closed and inoperative at low speed, when a rich mixture is required for the best results.

An Evinrude Booster

Matt McCarty, of Albany, N. Y., is an able seller of Evinrude motors, and when he's not selling them

Remember This Date!

The 1917 New York Motor Boat Show will be held at the Grand Central Palace, and it is expected by all to be the best ever staged. Although it is still some time in the future, it will be well to carry the date around in your head. This is the date—January 27 to February 3.

he is using one to propel around waterways which would be inaccessible to craft more pretentious than a rowboat. In a letter written a short while ago to the Evinrude Motor Co., of Milwaukee, Wis., he told first of some business which he had transacted and then went on to speak of one of his recent explorations. Parts of his letter follow: "I have just returned from six weeks in Florida. I carried my last year's demonstrating Evinrude in an ordinary trunk, in a nest of bagging, and I hired all sorts of boats, little and big, at various places we stopped at, all the way from the Keys to Palm Beach. We went up the Miami River, 'way up to the Seminole Camp in the Everglades, and the Drainage canal on the Okechobee branch. We fished, hunted and explored orange groves along the waterways.

"We averaged a gallon of gas per day, which with the \$5 per week for the hire of the skiff, gave us a real motor boat at a nominal sum per day—and we used it constantly. This was the first time that I have ever carried the motor, and I never knew what a comfort and luxury my Evinrude was before. From now on all future trips will have a 'kicker' as the most important part of the outfit."

She Helped Miss Minny Win

Just how she did it will soon be made apparent, but let us first say that she is a back-yard-built



Richard II was built from K-D by R. L. Kreps, of Detroit, Mich., and was selected to serve during the Gold Cup races as one of ten patrol boats



Imp is a 30-footer owned by a resident of Bangor, Me. Her 12 h.p. Ferro drives her through the water at nearly a 12-mile rate

32-footer constructed by R. L. Kreps, of Detroit, Mich., from knock-down frames supplied by the Niagara Motor Boat Co., of North Tonawanda, N. Y. She has in her a three-cylinder two-cycle 25 h.p. Ferro which gives a 14-mile speed, turning a 20 x 30-inch three-bladed Michigan wheel. One of her most original features is the arrangement of the seats, the two forward ones being so designed as to accommodate, in addition to the helmsman and his side partner, two 30-gallon gasoline tanks, while the back of each opens up to form a locker for the disposal of Government equipment and amokables and drinkables. Under the after seat are a toilet and an ice box.

Having been launched the first of July, she had to wait until the second of September before stepping into fame, but then she did it in a wholly satisfactory way. The Miss Detroit Power Boat Association desired the services of ten patrol boats to clear the course for the Gold Cup races and wanted, moreover, the niftiest looking ten in Detroit waters. When they selected Richard II (we have been trying to dodge the name because it doesn't fit in with all the feminine pronouns we've been using), when they selected Richard II, her (we have to say it) owner felt that a distinct compliment had been paid the Ferro motor, the boat and himself. And he, his boat and her motor upheld the trust that had been reposed in them, and in keeping Station 9 safe from the inroads of excited small fry, helped Miss Minneapolis to win the Gold Cup. Perhaps that wasn't the result that the owners of Miss Detroit had in mind, but the well laid plans of mice and men oft gang aglee. And so happy Richard's picture helps grace this page.

Imp, a 30-Footer

Imp is a 30-footer owned by Harold F. Moon, of Bangor, Me. She is powered with a 12 h.p. Ferro motor which gives a speed of 11½ m.p.h., and at this speed she hardly makes a ripple in the water. We have this from the owner, who would hardly speak otherwise than truthfully in the matter. But aside

from this, the reliability of Imp's power plant goes a long way toward making the owner proud of his possession.

Bosch Builds Still Another Addition

The recent big addition to the extensive Springfield (Mass.) works of the Bosch Magneto Co. is to be supplemented by another which will provide 60,000 square feet more. Ground has been broken for the new building, and its completion will be rushed to the utmost. The addition is to be a single-story edifice with the saw tooth type of roof to provide the maximum of light and ventilation. When this second addition has been completed there will have been more than 130,000 square feet of manufacturing space added to the Bosch plant during the current year.

Kingfisher, E. L. King's New Express Cruiser

E. L. King, of Winona, Minn., a prominent yacht-



Evelyn Mary is a Hand V-bottom runabout, a duplicate of Virginian. She is owned by Dr. Joseph Burke, a Buffalo surgeon, and is powered with a four-cylinder Sterling, which gives a 32-mile speed

man, has just placed a contract with the Great Lakes Boat Building Corp., of Milwaukee, Wis., for a high-speed cruiser. Mr. King has had extensive experience with boats of various types and sizes, and demanded in his new boat comfort and

type, as comfortable quarters are provided for a party of eight and a crew of three.

The galley is located forward, is fully equipped, and is a marvel of convenience. The ice-box extends the entire width of the boat and is of large capacity. On the port side is a stove with oven, and on the starboard side is a sink with running hot and cold water and a fireless cooker concealed under the copper-covered sink top. Ample provision is also made for storage of pots, pans, dishes and provisions. Directly overhead is a large, specially arranged hatch, which, together with the ports, makes this one of the best ventilated portions of the boat.

The forward cabin is arranged with deep box spring transoms on either side, the backs of which are arranged to swing up, forming upper berths, providing sleeping accommodations for four. On the port side is a cleverly concealed closet and lavatory, opposite which is a combination locker and buffet. Additional hanging lockers are found at the after end of the cabin, one on each side.

The engines and the crew's quarters are located about amidships under the raised engine trunk and bridge deck. The power plant will consist of two new model six-cylinder, 60-hp Van Hlerck engines, each equipped with a two-unit Leeco-Neville electric starter. As one-man operation is provided, all controls are centered in the steering stand on the bridge. An independent Delco generating set provides an abundance of electricity for completely lighting the boat, in addition to the fans and a 1,500 c.p. Carlisle and Finch searchlight.

The bridge is a very roomy and comfortable one, with a wide, deeply upholstered seat of the extension type, which provides outdoor sleeping accommodation when desired. The helmsman's position will be protected by a folding plate-glass windshield.

The owner's quarters are located aft under a raised trunk and are a model of convenience in every respect. At the forward end there is a large lavatory with a connecting shower bath. The hot water supply tank for the bath and galley is located in the stack, cold water being fed to the various faucets by air pressure from the large water tanks under the after cockpit floor. On the starboard side is a large combination wardrobe and dressing-room with mirror and chest of drawers. The seat berths in the owner's cabin are of the box spring extension type, forming, when extended, a double bed on each side, providing sleeping accommodations for four.

Two steps up from the owner's quarters lead to an extremely large and comfortable after cockpit, which, except for the deep leather upholstered seat extending across the stern, is equipped with wicker furniture. The cockpit and bridge deck alike are completely inclosable in inclement weather.

As the owner is a follower of the seasons, Kingfisher will be in use at his winter home at Daytona, Fla., in the winter months, and at his New York residence in spring and fall, while in the summer the home port will be the King estate, Rockledge, on the upper Mississippi.

The builders expect to complete construction by December 15, delivery being made by rail to Jacksonville, Fla.

To Improve Aids to Navigation in Hudson River

Improvements in aids to navigation on the Hudson River, N. Y., are to be made, on account of the fact that the present lighting is obsolete, and because of the poor condition of many of the existing aids to navigation while they are so constructed that it is impossible to keep them in operation when the ice commences to move. The plans for improvements include a modern system of flashing lights, on concrete foundations so as to resist ice damage. This is required on account of the large freight and passenger traffic. The sundry civil act, approved July 1, 1916, appropriated \$100,000 for improving the aids to navigation and establishing new aids on the Hudson. Instructions have been given by the Lighthouse Service of the United States Department of Commerce that the work proceed as promptly as possible.

The work contemplated to carry out the provisions of this appropriation consists of rebuilding the light and fog signal at Stony Point; improving existing aids

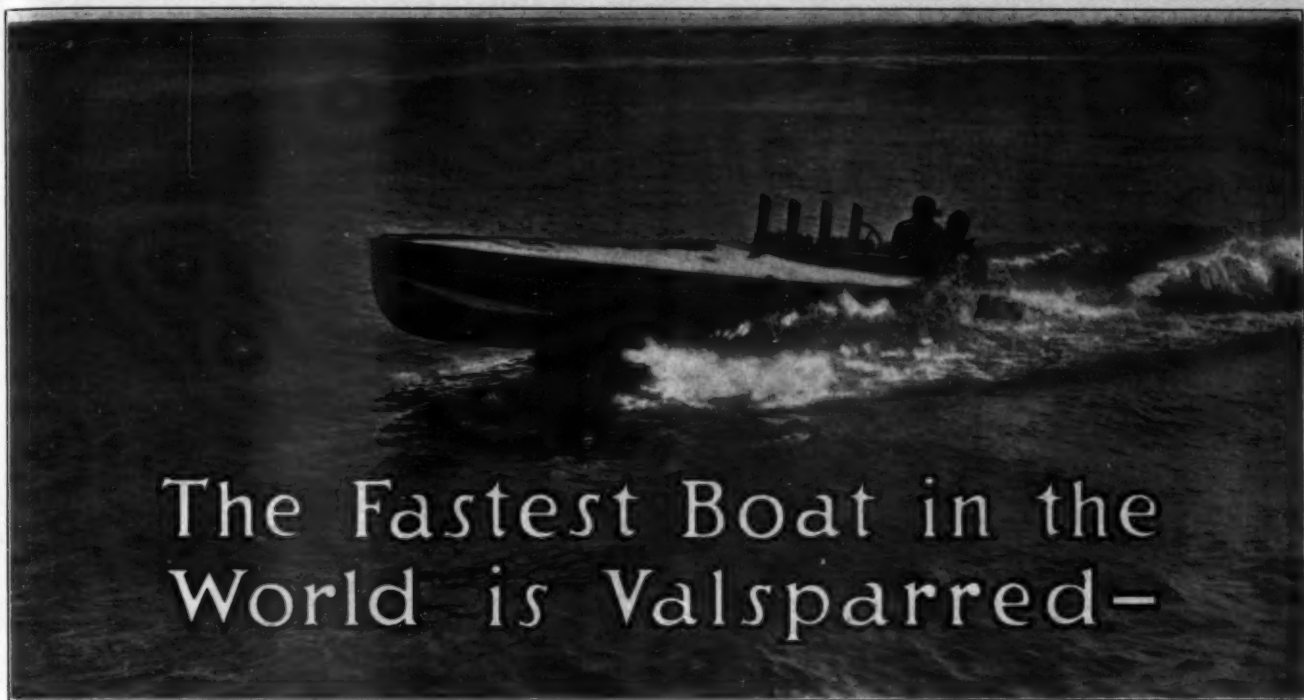
(Continued on page 58)



The bigger the party the better Frank likes it. Frank, it should be said, is the name of the boat, a 30-footer powered with a 25-30 h.p. Buffalo, and belonging to W. Wright, of Winnipeg, Can.

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		Oberdorfer Brass Co., M. L.	76		
		Outing Publishing Co.	60		
		P			
		Palmer Bros.	54		
		Paragon Gear Works.	81		
		Y			
		Youngs, Wm. P., & Bros.	64		



The Fastest Boat in the World is Valsparred—

Photo by The Baker Art Studio, Detroit, Mich.

"Miss Minneapolis" is the latest sensation in boating circles. She was built by the C. C. Smith Boat & Engine Company of Algonac, Michigan, and is the fastest thing that floats.

"Miss Minneapolis" won the famous Webb Trophy at St. Paul and the Free - for - All Hydroplane Trophy at Put-in-Bay. In these races she averaged 61.7 miles per hour and covered one mile at the rate of 63.86 miles per hour—the greatest speed ever attained by a boat.

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time to revarnish every time they get wet. It is to be expected, therefore, that the builders of such boats would use Valspar on the bright work. The builders of "Miss Minneapolis" did.



The large number of famous craft that are Valsparred is no coincidence. Their builders can afford nothing but the best, so they select Valspar, the long - oil, quick-drying varnish that laughs at water and keeps the woodwork as good as the motor.

The next time you buy varnish for your boat, *specify Valspar* and do away with the necessity of mid-season refinishing.

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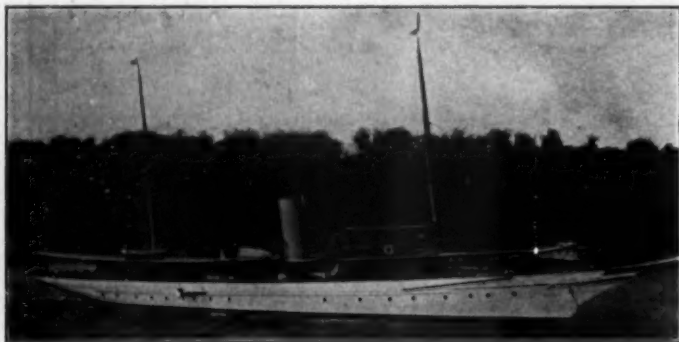
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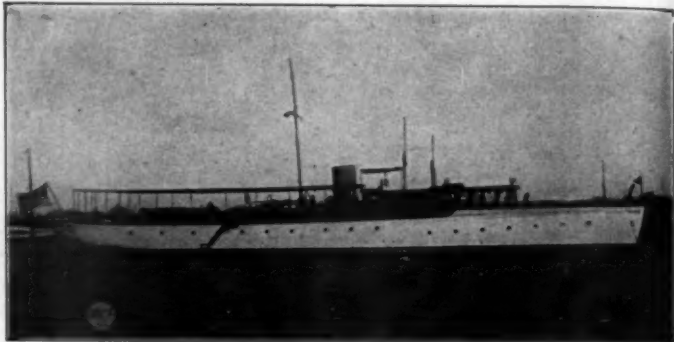
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We have a complete list of all steam and power yachts, auxiliaries and houseboats available FOR SALE and CHARTER. A few are shown on this page. Plans, photographs and full particulars furnished on request. Catalogue illustrating types and sizes of yachts we have for sale will be mailed on application.



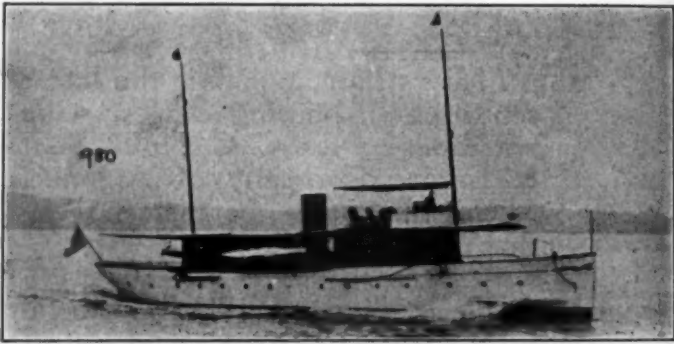
No. 229—For Sale—Fast, twin screw, steel steam yacht, 155 x 18 x 7.6 ft. Speed up to 18 miles. Dining saloon and social hall on deck. Five staterooms, two bathrooms, etc., aft. Handsomely finished and furnished. Cox & Stevens, 15 William Street, New York.



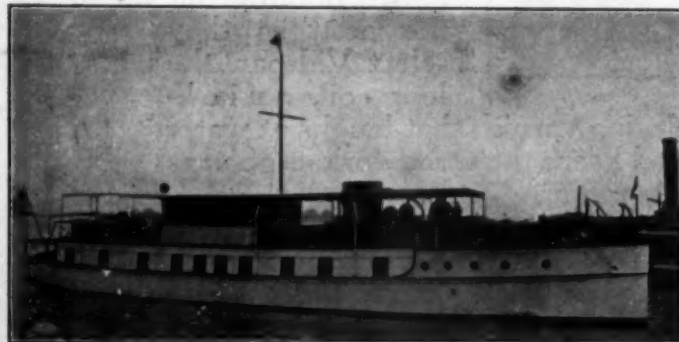
No. 885—For Sale or Charter—Handsome, fast 120 ft. twin screw steel power yacht. Speed up to 18 miles. Large dining saloon on deck, three double staterooms, main saloon, two bathrooms, etc. Price attractive. Cox & Stevens, 15 William St., New York.



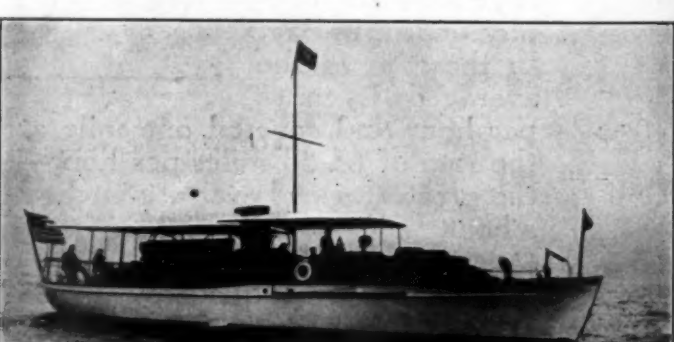
No. 363—For Sale or Charter—Most attractive houseboat of large size; luxuriously furnished; all conveniences; must be seen to be appreciated. Cox & Stevens, 15 William St., New York.



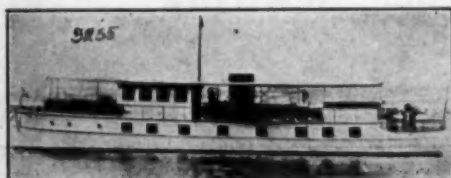
No. 980—For Sale—Steel twin screw cruising power yacht, 98 x 16 x 5 ft. Speed 14-16 miles. Dining saloon and social hall on deck; four staterooms, bath, two toilets, etc. In commission. Attractive price. Cox & Stevens, 15 William St., New York.



No. 2100—For Charter—Especially desirable, twin screw gasoline houseboat; 95 x 19.3 x 3.3 ft. Speed 12-13 miles. Large social hall on deck, main saloon, four double staterooms, bath, two toilets, etc. Handsomely finished and furnished. Cox & Stevens, 15 William St., New York.



No. 2428—For Sale or Charter—Attractive gasoline cruiser, 75 x 14 x 4 ft. Built by well known firm 1913. Speed 12 miles. Dining saloon and galley forward; two double staterooms and bath aft. Cox & Stevens, 15 William St., New York.



No. 3235—For Charter—Twin screw gasoline houseboat; 80 x 16.7 x 2.10 ft. Recent build. Speed 10 miles. Deck saloon, main cabin, three double staterooms, etc. Reasonable figure. Cox & Stevens, 15 William St., New York.



No. 2023—For Sale—Modern bridge deck cruiser, 55 x 12 x 4 ft.; 6 cylinder, 65 H.P. Sterling motor, new 1916; speed, 12 miles. Double stateroom, large saloon, bath and toilet room, etc. Interior finish, African mahogany. Large bridge and after deck. Cox and Stevens, 15 William St., New York.



No. 3256—For Sale at low figure—Exceptionally roomy and modern bridge deck cruiser; 65 x 14 x 4 ft. 50-65 H.P. 20th Century motor; speed 10 miles. Three staterooms, saloon, galley, shower bath and toilet, etc. Further particulars from Cox & Stevens, 15 William St., New York.

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We have listed all the available Yachts for Sale and Charter that are adapted for Florida cruising and advise early selection. Full particulars upon request.
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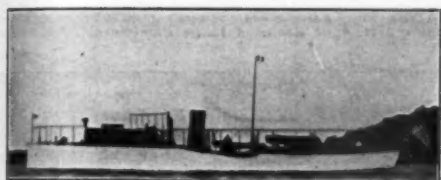
8344—Very fine Steel Ocean-going Cruiser. 275 ft. long. Perfect condition. Low price.



7840—Immediate sale desired of this 155 ft. Twin Screw Steel Steam Fast Cruiser. Speed up to 18 miles. Fine accommodations. Elegant appointments. Attractive price.



5233—Excellent chance to purchase 113 ft. First Class Steam Yacht. Cost \$60,000. Very economically maintained. Must sell immediately to close Estate.



8378—For Sale—113 ft. Twin Screw Lawley Cruiser. 5 staterooms. Speed up to 14 knots. After deck house added 1916.



8448—110 ft. Twin Screw Steel Coast Cruiser. 4 staterooms. Bath. Speed 14 miles. All conveniences.



8457—95 ft. Twin Screw Ideal Southern Cruiser for charter. In commission.



8401—For Sale—75 ft. Twin Screw Ideal Cruiser. 2.3 ft. draught. Exceptional accommodations.



8362—For Sale or Charter—This elegant 62 ft. Cruiser. Extraordinary seaboard. Now in Florida.



8402—65 ft. Coast Cruiser. Practically new. Low price.



8168—Exceptionally fine 63 ft. shoal draught cruiser. Two staterooms. Bath. Now in Florida.



8379—60 ft. Coast Cruiser available for Southern charter. Large stateroom and saloon.



8409—Brand new 53 ft. Twin Screw Express Cruiser. 2 staterooms. Speed 30 miles.



8133—55-foot Coast Cruiser. Fine accommodations. Very able seaboard. Low price.



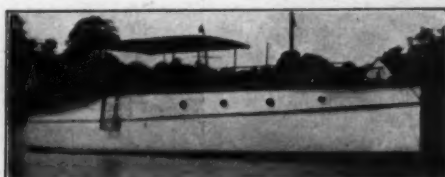
8376—45-foot de Luxe Cruiser. Best boat of type available.



8431—Ideal Craft for Southern cruising. 50 x 12.10 x 3. Two Standard motors, new 1914. Two staterooms. Low price.



8413—43 ft. Mathis Cruiser, new 1914. Perfect condition. In commission.



8440—Exceptionally able 40-foot bridge deck cruiser with two staterooms. Speed 11 miles.



8369—42-foot Coast Cruiser. Exceptionally high grade boat. Low price.

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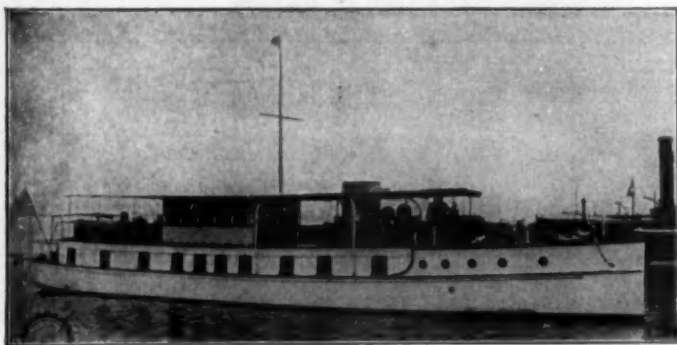
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NAVAL ARCHITECTS AND YACHT BROKERS

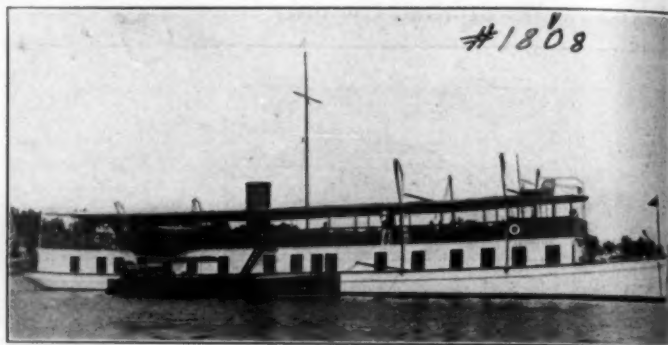
Telephone
4510 John

52 Pine Street
New York City

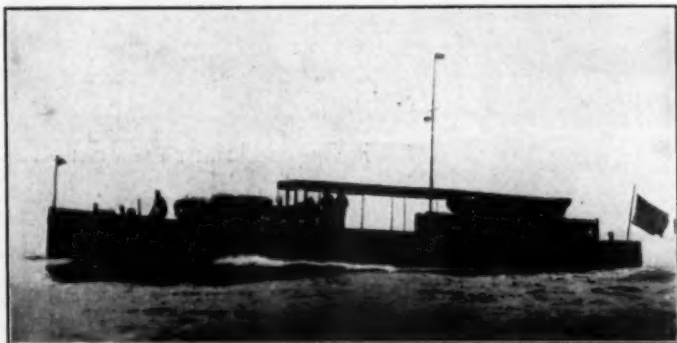
Offer for sale or charter the following yachts, all being ideally suited for Florida waters. We have specialized in Southern charters and can offer the available yachts adapted for Southern cruising.



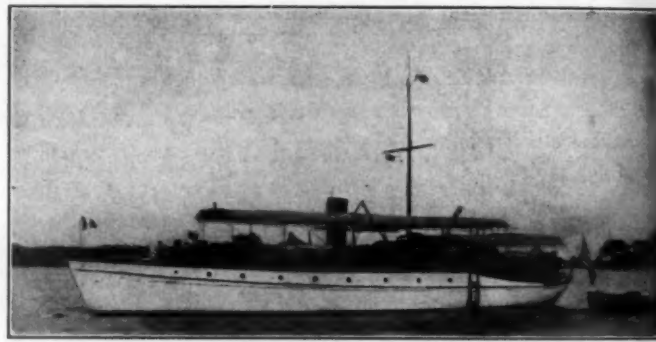
No. 1871—Sale—Charter—Modern motor houseboat. 95 ft. x 19 ft. x 3.3 draft. 4 staterooms, dining saloon, social hall, etc.



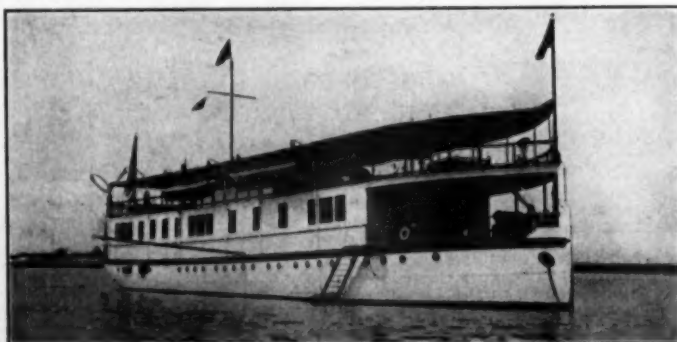
No. 1808—Sale—Charter—Twin Screw Houseboat, admirably suited for Southern waters, 125 ft. x 17 ft. 8 in. x 3 ft. 4 in. draft. 4 Large staterooms, 2 bathrooms, saloon, etc.



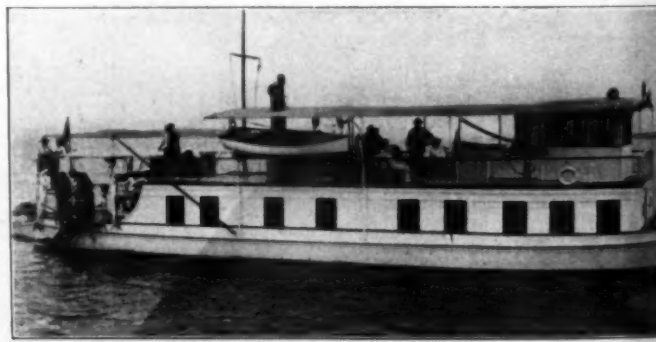
No. 7099—For Sale—Most desirable twin screw day cruiser available, 67 ft. 10 in. x 12 ft. x 3 ft. 9 in. draft. Designed by us; built 1911. Two 20th Century motors. Speed up to 14 miles. Very large cockpit.



No. 7674—Sale—Charter—Modern twin screw motor yacht 75 ft. x 17 ft. 6 in. x 3 ft. 8 in. draft—20th Century motors. Speed, 12 miles. One double and one single stateroom and very large main saloon.



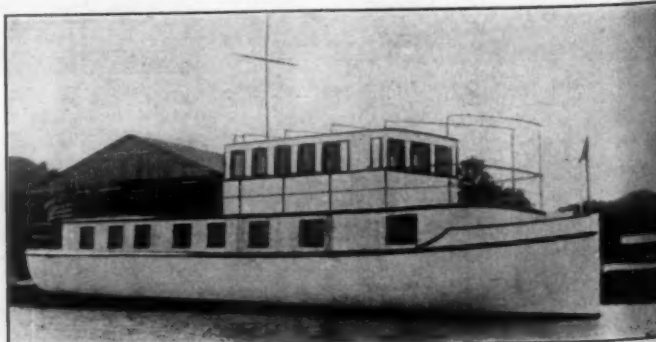
No. 1805—Available for Winter Charter—Modern twin screw, 125 ft. houseboat. 8 Large staterooms, 3 bathrooms, and 3 saloons.



No. 1860—Sale—Charter—Desirable Houseboat, 70 ft. x 18 ft. 6 in. x 18 in. draft. 2 35 H.P. Sterling motors new 1915. 3 double staterooms, saloon, deckhouse and bathroom.



No. 1847—Sale—Charter—Shallow draft houseboat, 85 ft. x 18 ft. x 28 in. 4 staterooms, large main saloon and bathroom.



No. 1912—Charter—Modern Houseboat, 64 ft. x 17 ft. 6 in. x 3 ft. 2 in. draft. 3 staterooms, main saloon, sitting room on deck, bathroom, etc. Standard motor.

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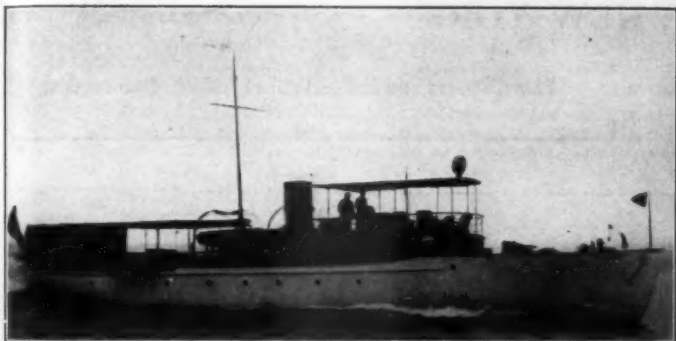
NAVAL ARCHITECTS
ENGINEERS
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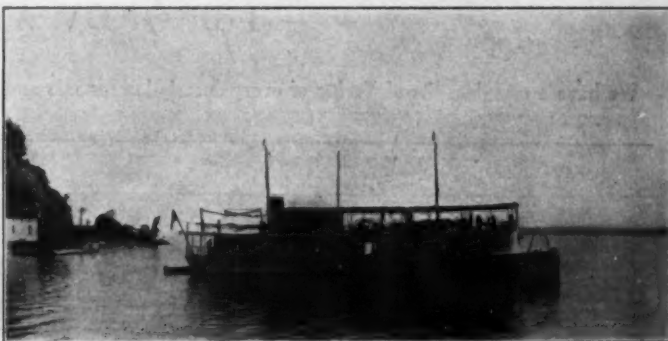
52 BROADWAY, NEW YORK

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Crogie, New York
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We can offer any yacht available for purchase or charter



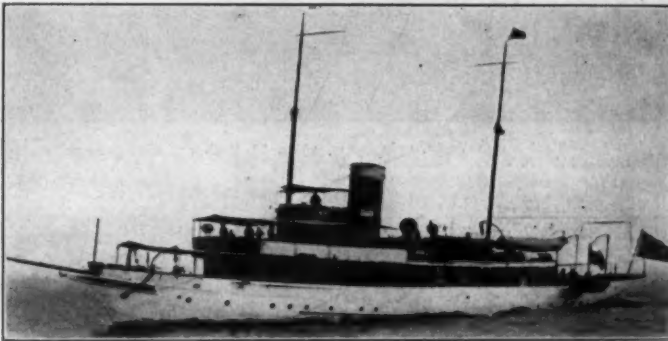
No. 3664—For Sale or Charter—105 ft. twin screw cruising motor yacht. Fine condition throughout, excellent accommodations, well appointed. Speed up to 20 miles.



No. 5308—For Sale—Comfortable and strongly built cruising houseboat, 110 ft. over all. Five staterooms, two baths.



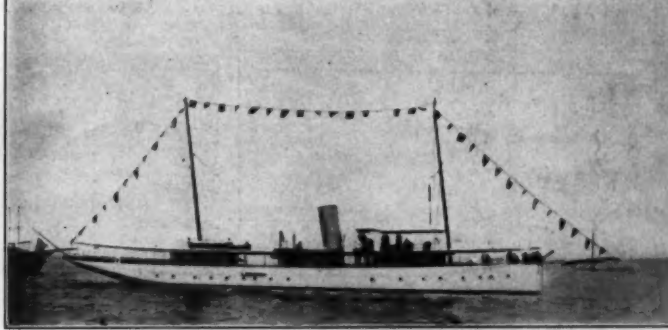
No. 5532—For Sale or Charter—62 ft. over all, 3 ft. 6 in. draught. Two double staterooms, bath, deckhouse and dining saloon. Practically new. Located in Florida.



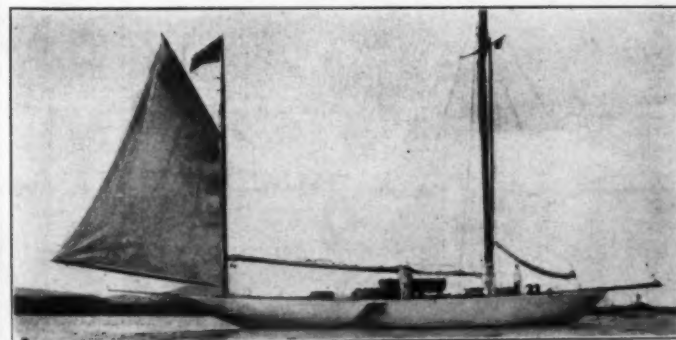
No. 212—For Sale—About 175 ft., heavily built, steel steam yacht, cruising speed 14 knots. Double bottom for water ballast. Five staterooms for owner, two baths. Has wireless equipment.



No. 5585—For Sale—45 ft. Elco bridge deck cruiser, new this season. Complete equipment, electric self-starter and lighter. Private stateroom. Standard motor.



No. 1750—Bargain—Twin screw steel steam yacht, 155 x 18 x 8 ft. Speed up to 15 miles. Three double and two single staterooms, two berths. Well kept up.



No. 504—For Sale—Roomy and comfortable Herreshoff Auxiliary Yawl, 76 ft. over all x 14 ft. beam, 9 ft. draught. Inspection invited.



No. 1850—Sale or Charter—98-foot auxiliary schooner. Three staterooms, bath. Excellent sea boat.

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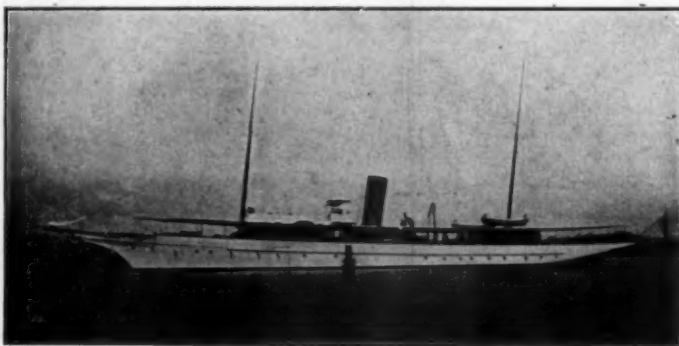
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Yachting, N. Y.

We have a complete list of Yachts of every description for sale and charter.

Plans, Photos and full particulars furnished on request



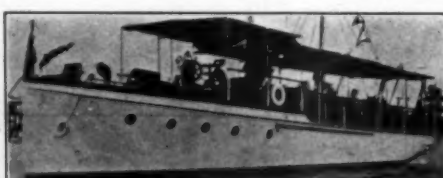
No. 181—Steel Steam Yacht, twin screw, 155 x 18, Seabury built; good accommodations, speed 16-18 miles. In commission.



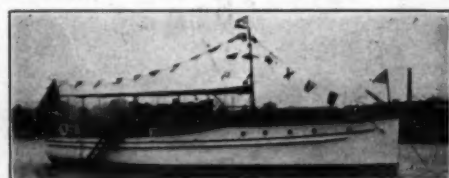
No. 1549—Steel Power Yacht, 98 x 16, two Standard motors, 125 H. P. each. Exceptionally good accommodation.



No. 173—Power Houseboat, twin screw, 66 x 16, draft 39 inches, heavy construction, motors new 1914.



No. 1880—Able Cruiser, 60 x 12, built 1913, new 6-cylinder motor, bridge control. Good accommodation.



No. 1837—Staunch Cruiser, twin screw, 50 x 13, light draft, Standard motors. In commission.



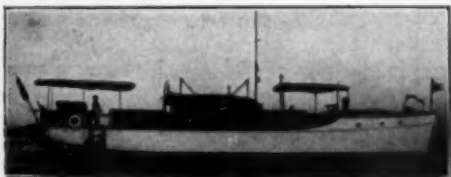
No. 2094—Splendid Cruiser, 65 x 14, recent build, Twentieth Century motor, 3 staterooms, bath, etc.



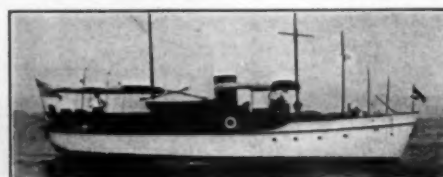
No. 1927—Ideal cruiser, recent build, 65 x 13 x 3.6, six-cylinder Twentieth Century motor, first-class condition.



No. 64-H—Florida Houseboat, 62 x 17, light draft, tunnel stern, 50 H.P. motor, large accommodations.



No. 2072—Winter Charter—Florida—Light draft cruiser, 60 x 12.6 x 3.6, excellent quarters.



No. 1869—Bridge Deck Cruiser, 56 x 12 ft., light draft, 4-cylinder engine, speed 11 miles. Actively in market.



No. 1956—Desirable cruiser, 52 x 11.6. Twentieth Century motor, everything in good condition. Price reasonable.



No. 1625—Twin Screw 60 ft. motor boat, two new six-cylinder Sterling; speed 15 miles.



No. 1779—Raised deck cruiser, 56 ft. x 13.2 ft. x 3 ft. 20th Century motor. Bottom coppered for Southern use. Price reasonable.



No. 2167—Modern 50 ft. Cruiser, six-cylinder Sterling motor. Cabin, two double staterooms, etc.

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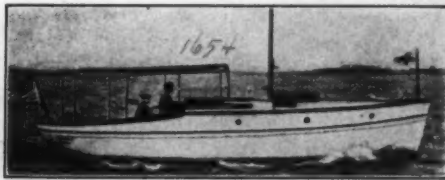
New York City

Surveying
Marine Insurance

Our list comprises all the available yachts for sale and charter. Below are a few of our offerings. If none of these appeal to you, write us your requirements. Our knowledge of the yachts we offer, and our 22 years' experience in the business, insure satisfaction to any one buying or chartering a yacht through this office.



No. 1675—45-foot cruiser, large cabin with upper and lower berths, sleeping eight. Speed 16 knots.



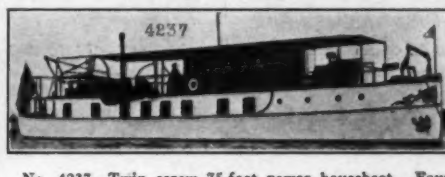
No. 1654—30-foot cruiser. Cabin with two berths. Speed 10 miles.



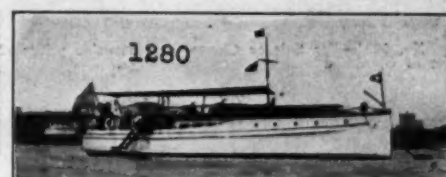
No. 1406—50-foot cruiser. Stateroom, saloon, sleep six. Speed 10 miles.



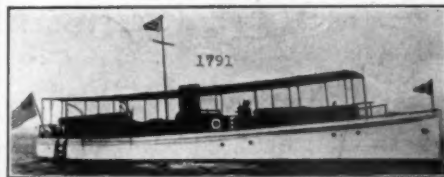
No. 1800—55-foot cruiser. Two staterooms and saloon, sleep six. New Standard motor 1916. Speed 11 miles.



No. 4237—Twin screw 75-foot power houseboat. Four staterooms, large saloon and music room, bath, etc.



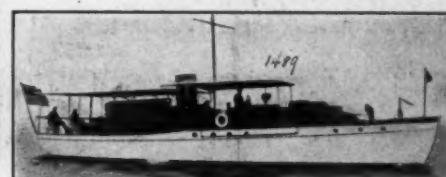
No. 1280—Twin screw 50-foot cruiser. Stateroom and saloon. Speed 12 miles. Suitable for Florida waters.



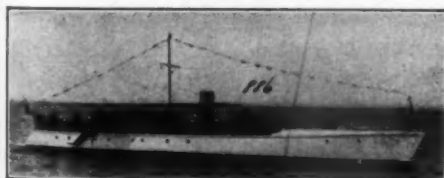
No. 1791—65-foot cruiser. Three staterooms, saloon, bath, etc. Speed 11 miles.



No. 1137—Twin screw 62-foot cruiser. Three staterooms, dining saloon, and lounging room. Speed 10-12 miles.



No. 1489—75-foot cruiser. Two staterooms, saloon, bath, etc., speed 12 miles.



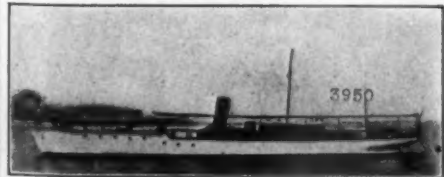
No. 886—Twin screw 93-foot express cruiser. Stateroom and saloon. Speed 20-25 miles.



No. 4234—45-foot auxiliary centreboard yawl. Light draught. Stateroom and cabin with two berths. Electric light, etc.



No. 3758—90-foot auxiliary keel schooner. Two double staterooms, saloon, bath, etc. Speed 9 miles.



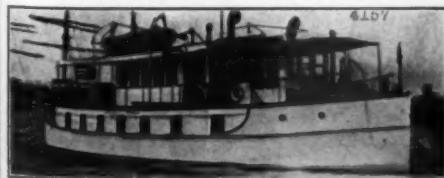
No. 3950—98-foot express steam yacht. Two staterooms, saloon, etc. Speed 17 miles. Owner will exchange for power houseboat.



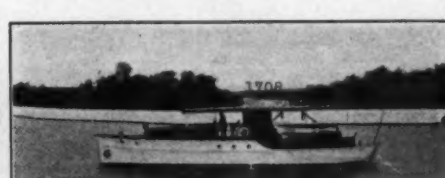
No. 1017—75-foot twin screw cruiser. Two double staterooms, saloon, bath, etc. Speed 12 miles.



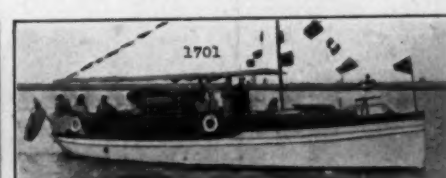
No. 1782—80-foot twin screw power yacht. Three staterooms, saloon, bath, etc. Speed 13 miles.



No. 4157—70-foot twin screw power houseboat. Two staterooms, main saloon, dining saloon, bath, etc. An ideal boat for Florida cruising.



No. 1708—55-foot semi-houseboat and cruiser. Three staterooms, large saloon, bath, etc. Speed 10 miles.



No. 1701—45-foot cruiser. Two double staterooms and saloon, two toilets, etc.

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FRANK BOWNE JONES, Yacht Agent

Cable Address "Windward," N. Y.

29 Broadway, New York

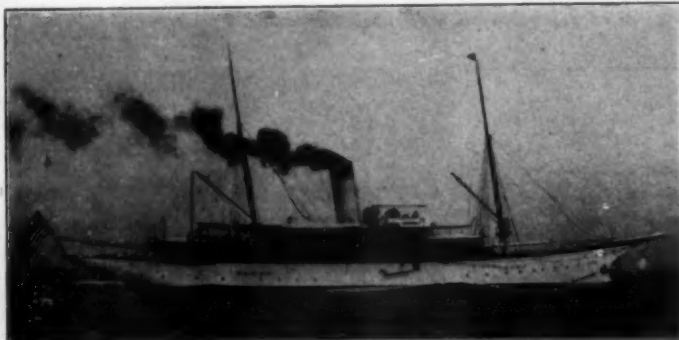
Telephone, Rector 3890

High-Class Yachts of all types for sale and charter

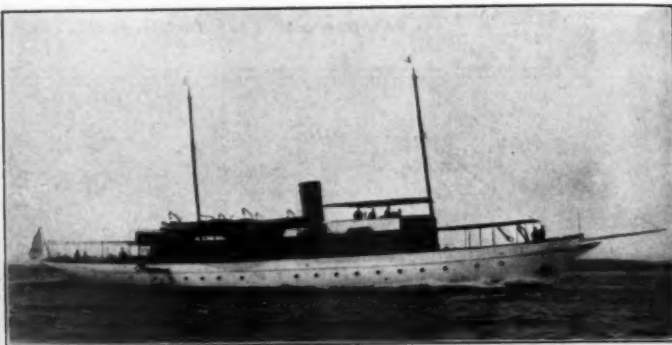
NAVAL ARCHITECTURE

Description, Prices on Request

MARINE INSURANCE



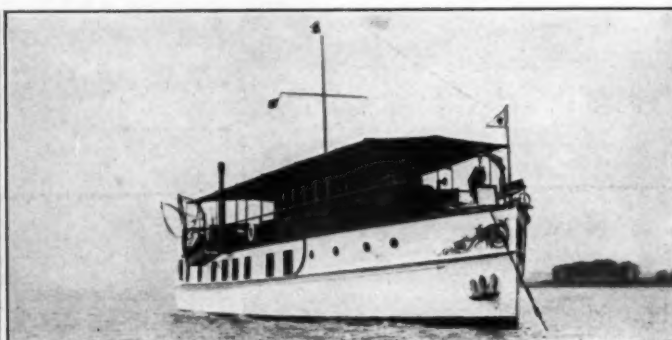
No. 3904—For Sale or Charter at reasonable prices—200 ft. Steam Yacht in the best of condition.



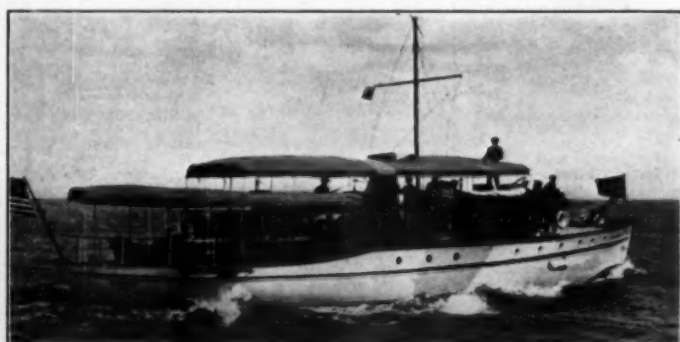
No. 4925—175 ft. Desirable Steam Yacht offered for quick sale; reasonable price.



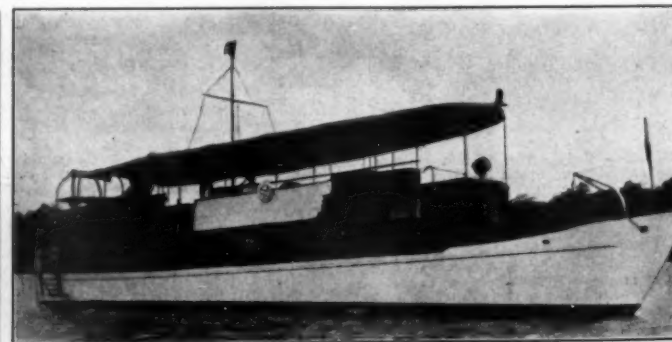
No. 5952—High Class Power Yacht; 100 ft x 16 ft x 5 ft; twin screw; Standard engines; extremely comfortable.



No. 6913—75 ft. Light Draft Houseboat of most modern design; twin screw; Standard engines.



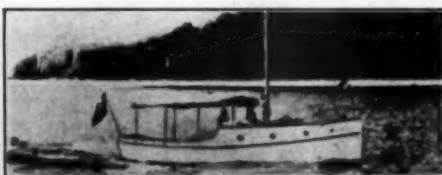
No. 4840—For Sale or Charter—75 ft. Gasoline Yacht; well appointed; Standard engines; deliverable in Florida.



No. 6030—For Sale—70 ft. Motor Yacht; houseboat type; desirable for southern waters; high grade engine.



No. 4599—For Sale or Charter—57 ft. Motor Yacht; light draft; airy accommodations.



No. 6837—For Sale—33 ft. Heavily Constructed Motor Boat; 4-cylinder Standard engine; desirable for fishing.



No. 3053—40 ft. Express Cruiser; built 1916. Speed 25 miles per hour. Owner wants offer.

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Yacht and Ship Brokers
Marine Insurance

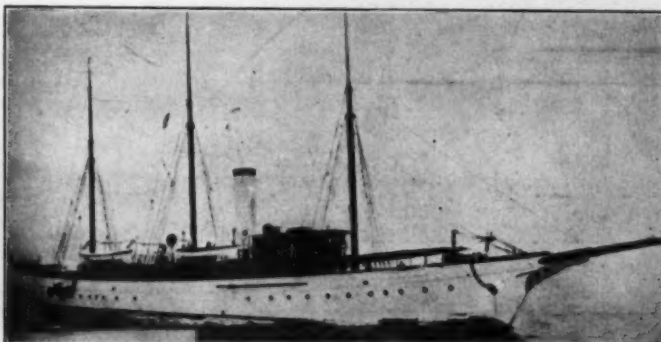
We have listed for sale, charter and exchange only
the best yachts and motor boats that are available.

42 BROADWAY

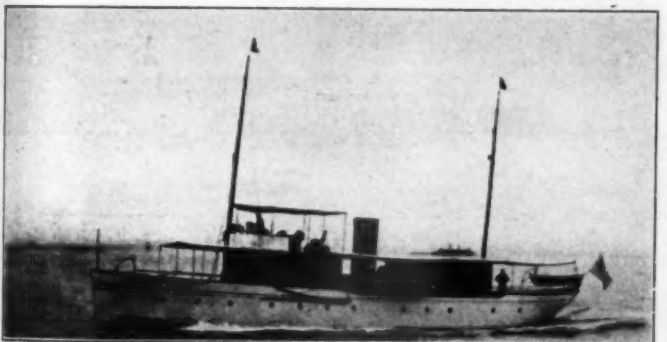
NEW YORK



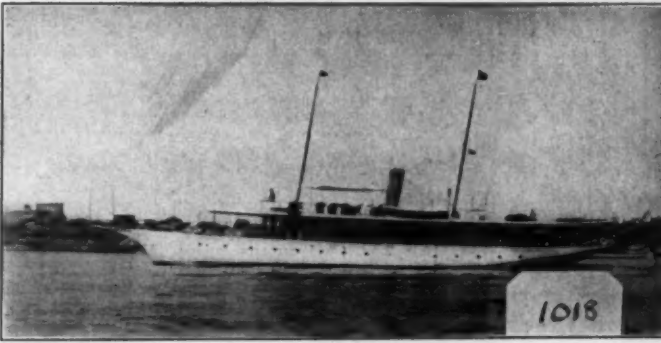
No. 1019—For Sale—115-foot flush deck steam yacht. Lawley construction, double planked. Sleeps nine in owner's party. Cruising speed 12 knots. Maximum 15. Economical to operate. Fully found. First-class condition throughout.



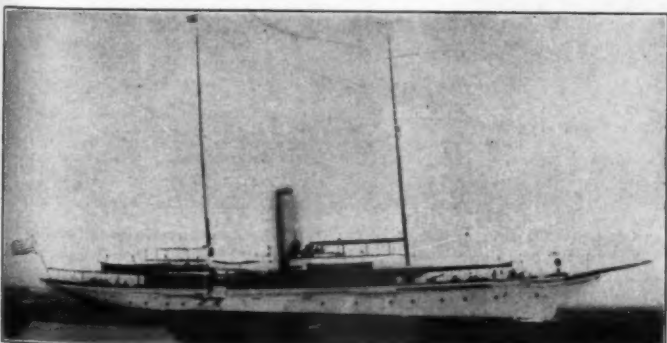
No. 1008—For Sale—Seagoing 245-foot steel steam yacht, with all conveniences for offshore cruising. Particularly fine seaboard. Will be sold at reasonable figure.



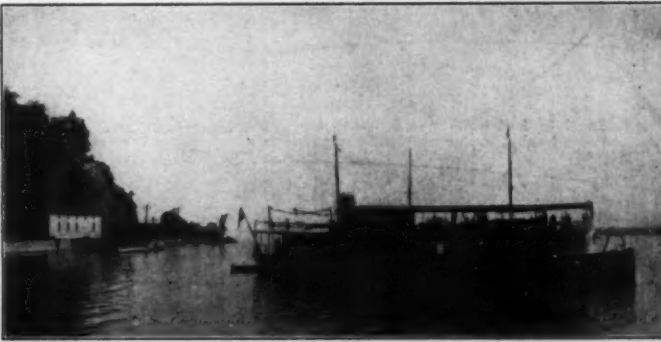
No. 5056—For Sale—Best 98-foot twin screw, flush deck, steel motor yacht available. Unusual accommodations. Fine condition throughout. Subject closest inspection. Fully found.



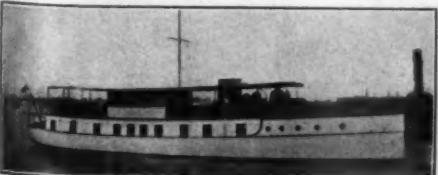
No. 1018—For Sale to close an Estate—Roomiest and most economical 112 ft. cruising steam yacht afloat. High class throughout. Low price.



No. 1101—For Sale or Charter—165-foot seagoing steam yacht. Sleep 11 in owner's party. Condition A-1 throughout.



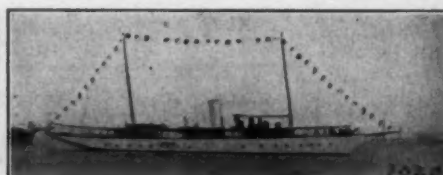
No. 3015—For Sale—110-foot twin screw houseboat, recent construction, heavily built. Unusual accommodations. Ideal for Southern cruising. Fine condition throughout.



No. 3014—For Charter—For service in Florida waters for the months of January, February and April (not March), 95-foot twin screw modern houseboat. Unusually fine boat with excellent accommodations.



No. 5053—For Charter in Southern waters—Available for short or long periods any time after November 1st at Jacksonville, 75-foot twin screw motor yacht. Fine accommodations.



No. 1020—For Sale—Attractive price—High-class 160-foot fast cruising steel steam yacht. Excellent accommodations. Perfect condition throughout.

When writing to advertisers please mention *MOTOR BOATING*, the National Magazine of Motor Boating.
Advertising Index will be found on page 38.

SOUTHERN YACHT AGENCY

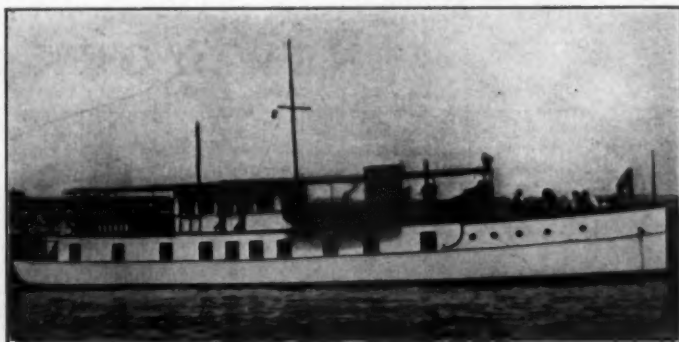
American Building

Baltimore, Md.

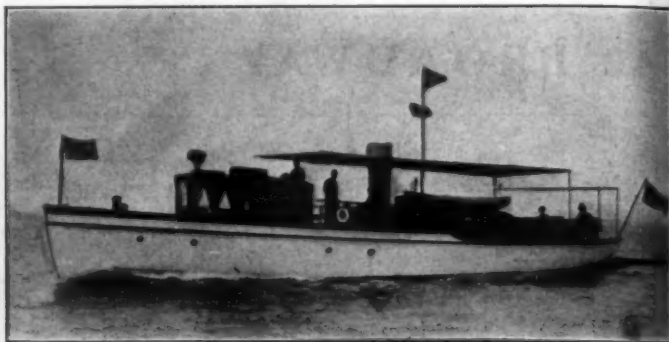
We have on our list all the desirable yachts available for sale or charter for

FLORIDA

Several representative boats are shown on this page



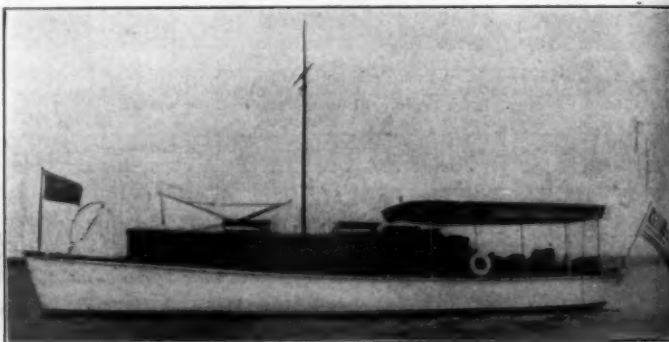
No. 683—Charter—Twin screw houseyacht, 95 x 19.3 x 3.3. Social hall on deck. Dining saloon below. Four double staterooms, bath, etc. Steam heat.



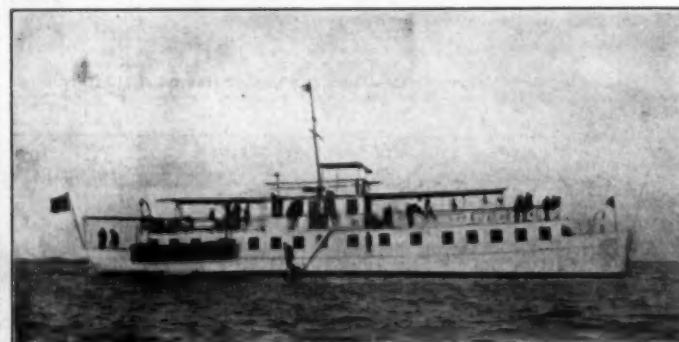
No. 583—Charter—78 x 14 x 3.5. Twin screw. Deck dining saloon, two double and one single staterooms, bath, etc. Very reasonable.



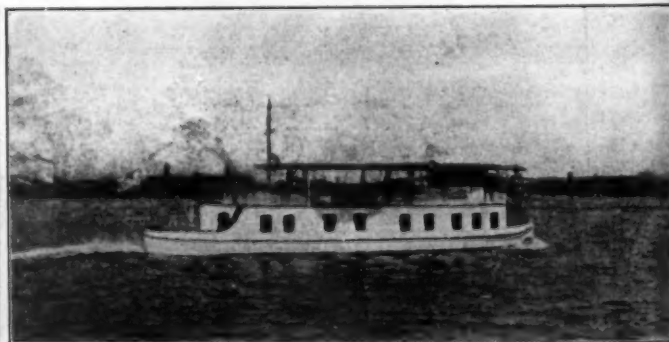
No. 353—Charter—72 x 12 x 3.6. Good accommodations. Will be located in Florida this winter and available for long or short cruises at very reasonable rates.



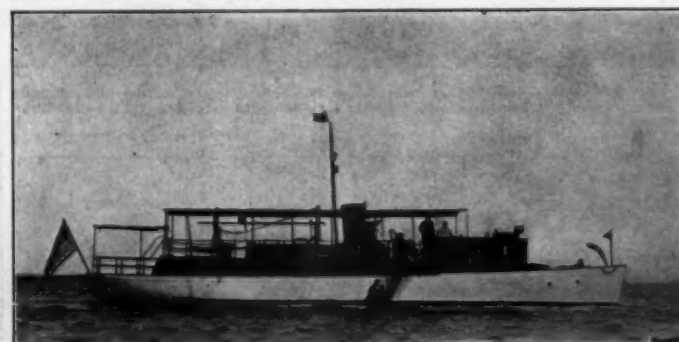
No. 709—For Sale—46 feet. 32-37 H.P. Standard 4-cyl. Speed 11 miles. Very handsome. Good as new. Bargain.



Charter—110 ft. twin screw houseyacht. Saloon on deck and four double staterooms and saloon below. Located in Florida.



Charter—70 ft. twin screw houseyacht. Three double staterooms, saloon and bath. Located in Florida.



No. 300—For Sale—Cruiser, 70 x 14 x 3.6. Two saloons. Two large staterooms, bath, etc. Has proven well adapted for Florida.



No. 718—For Sale or Charter—Auxiliary schooner, 59 x 18 x 2.6. Three large staterooms. Two saloons. Especially designed for southern cruising. Economically maintained.

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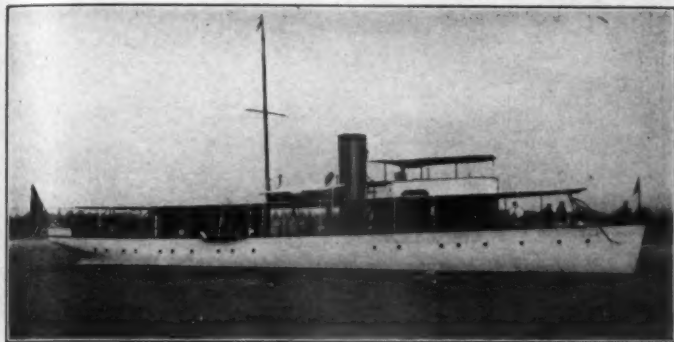
EDWARD P. FARLEY CO.

NAVAL ARCHITECTS YACHT BROKERS

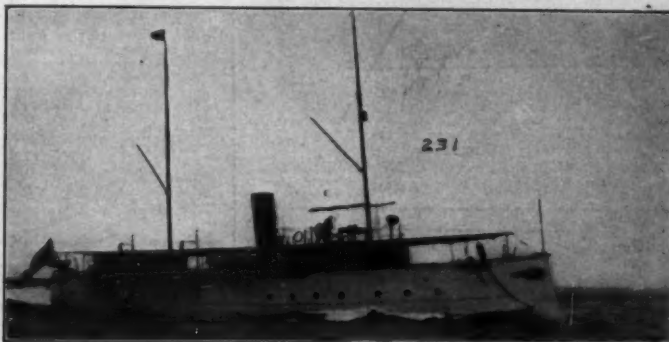
Tel. Harrison 1344

80 E. JACKSON BOULEVARD, CHICAGO, ILL.

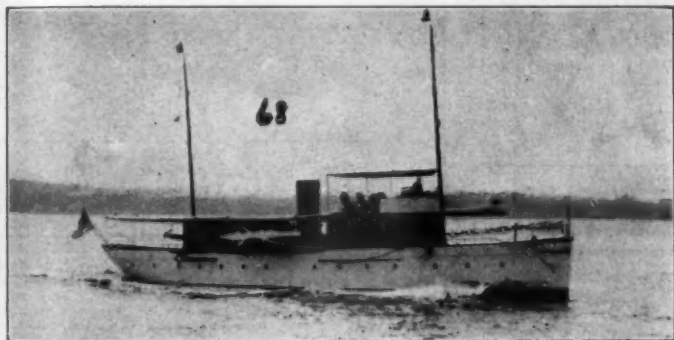
WE OFFER FOR SALE AND CHARTER the most desirable boats of all types on the Great Lakes and Coasts. Plans, photographs and full particulars furnished upon request.



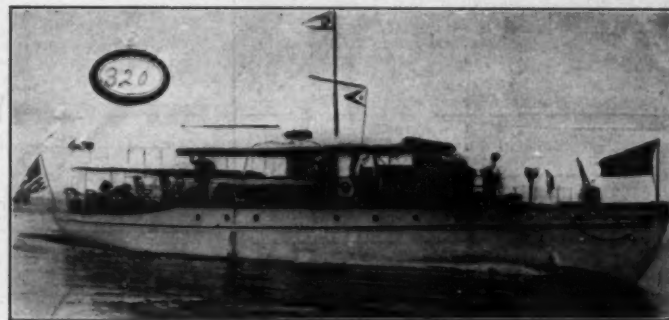
No. 606—For Sale—Modern 122 ft. steel steam yacht. Splendid accommodations. Two deckhouses. Five staterooms.



No. 231—For Sale or Charter—Very attractive steel steam yacht. 145 ft. x 18 ft. 4 in. x 9 ft. draft. Sleeps six to eight. Two bathrooms. Speed 18 to 20 miles. Superior boat; in splendid condition.



No. 68—For Sale—Twin screw steel motor yacht. 99 ft. x 16 ft. x 5 ft. A very comfortable cruiser with all modern conveniences. Designed for off shore cruising. Equipment complete and boat in first-class condition.



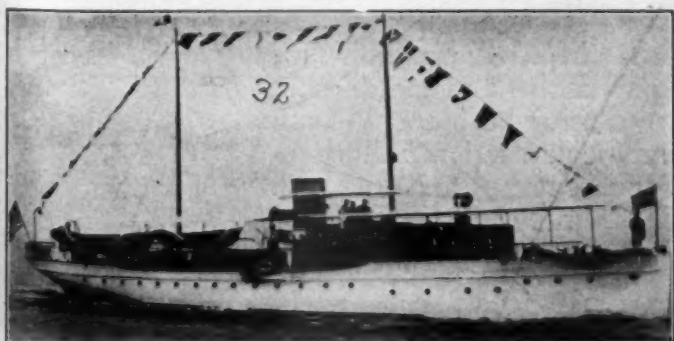
No. 320—For Sale or Charter—Very able 75 ft. gasoline power yacht. Two staterooms. Standard motors.



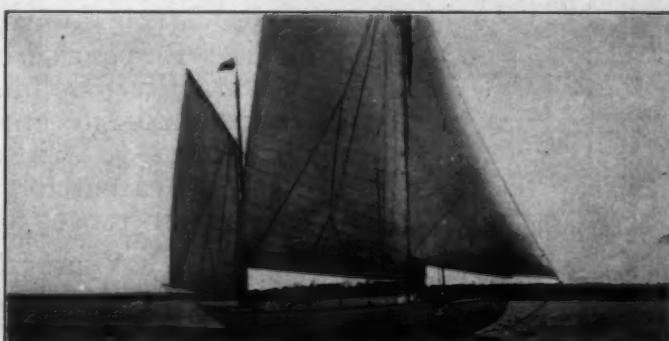
No. 88—For Sale or Charter—70 ft. power houseboat. Three staterooms, dining saloon, bathroom, etc. Splendid condition.



No. 73—For Sale—Exceptionally handsome 51 ft. power cruiser. Double and single staterooms, dining saloon, recent build. Complete equipment.



No. 32—For Sale—Modern 98 ft. twin screw cruising yacht. Excellent accommodations and an unusually fine sea boat. Price attractive.



No. 72a—For Sale—49 ft. auxiliary yawl. One stateroom. Large main saloon. Splendid cruiser and in first class condition throughout. Located on the Great Lakes.

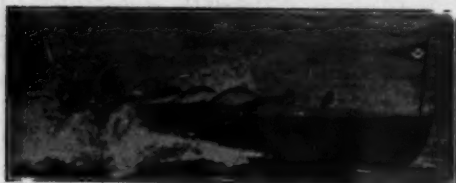
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THE MoToR BOATING MARKET PLACE

The rate for "For Sale" and "Want" advertisements is 3 cents per word, minimum 75 cents. If an illustration is used, the charge is as follows, which includes the making of the cut:
 Cut one inch deep, one column wide..... \$2
 Cut 1½ inches deep, 1½ columns wide..... \$5
 Cut three inches deep, three columns wide..... \$15

**Opportunities
for the
Motor Boatman**

Before you buy or before you sell examine the exceptional buying and selling opportunities under this heading. They comprise the best offers of the month. Please mention MoToR Boating.



\$47.50 for a limited time, we will sell these seventeen-foot stepless hydroplanes at the above price for complete knock-down boat, which includes mahogany interior and every piece of material necessary to complete the hull. Other models at proportionate prices. Write for circulars.

HYDROPLANE CONSTRUCTION COMPANY
Point Pleasant, Kentucky.



Florida Houseboat, 40 ft. x 12 ft. x 3 ft. 3 in. Built 1916. Bridge deck control. 18 H.P. Standard motor. Burns 2½ gals. per hour, at 8 miles speed. The most economical yacht in the fleet. Accommodations liberal, including stateroom with real spring beds. Large dining saloon with extension transoms. Real large bath room with ¾-size tub. Loads of closet and drawer space. Great ventilation. Large observation deck with weather cloths. Two toilets; shipmate range for coal. Absolutely a one paid man proposition with berth forward. The handsomest little yacht-houseboat available. Asking only \$4000.00. Apply room 2112, 42nd St. Bldg., New York City.

FOR SALE—Hacker designed 32 ft. x 8 ft. cruiser, with electric lights, toilet, all brass fittings; shaft and strut ready for motor. Box 70, care, MoToR Boating.

FOREMAN WANTED—First-class man to superintend the installation of gas engines and other pipe fitting systems in MATTHEWS BOATS. Can also use the services of several good joiners and boat builders. The Matthews Boat Company, Port Clinton, Ohio.

An Elastic, Everlasting, Beat Leak Compound, **STICK-TITE**. Applied cold with putty knife. Saves caulking. Two pounds mailed \$1.00. Five pounds \$2.00. Insulative Co., Inc., One Broadway, New York.

FOR SALE—Countess—Express cruiser Champion for 1916. 40 ft. x 8 ft., motor E-8, 6 in. x 6 in. Van Blerck, speed over 30 miles. Hull mahogany double planked, perfect condition. Splendid boat for use in Florida, well adapted to fishing. Equipment complete and of the highest grade. Electric lights, etc. Price, \$10,000.00. Wm. H. Hand, Jr., New Bedford, Mass.



CABIN CRUISER, 45 ft. x 10 ft. x 3½.

35 H.P. Speedway Motor—Solid Mahogany interior. Construction first class in every respect. Original cost \$6500.00. Will sacrifice for immediate sale. This is one of the most complete boats of its type available. In perfect running order. For detailed description apply to J. W. Reese, 601 Carroll Bldg., Baltimore, Md.

2-cylinder, 4 cycle, 4¼ x 5 Auto engine, Gies reverse gear and propeller in fine condition for \$55. Others cheap. Elmer Calkins, Petoskey, Mich.

FOR SALE—Day Cruiser built 1915. Designed by Hacker. Speed 15-18 miles hour after hour. Splendid sea boat. Toilet, water, electric lights. Equipment especially complete. Engine 60 H.P. 6-cyl. Loew-Victor, new with boat. This is a high-class V-bottom outfit. C. C. Co., 168 West High Street, Carlisle, Pa.

USE "SNAPPER" ENGINES for your small boat. They are a big little engine built by The Automatic Machine Co., Bridgeport, Conn.



No. 2904—For Sale—Roomy power cruiser, 63 x 12.6 x 3.9 ft. Speed 9 miles; 35 H.P. motor. 2 double state-rooms, saloon, toilet, galley, etc. Excellent boat for Southern waters. Price low. Cox & Stevens, 15 William Street, New York.

FOR SALE—22 ft. Cabin Cruiser 6 H.P. Engine Bald-ridge reverse gear. In running order. Price \$200.00. Wm. Renz, 36 Sumner St., Quincy, Mass.

Runabout of exceptional merit. This beautiful V-bottom motor boat is especially designed for those who desire a snappy craft of seaworthiness and speed. She makes 20-22 miles. Is lavishly equipped. Powered with 50 H.P. 4 cyl. Sterling motor new 1916. C. C. Co., 168 West High St., Carlisle, Pa.

CANADIANS, Second-hand engine bargains. Send for list. **GUARANTEE MOTOR COMPANY**
73 Bay Street, North Hamilton, Ont., Canada.

Foreign Business From MoToR Boating

August 22, 1916.

H & N CARBURETOR CO., INC.,
1790 Broadway, New York, N. Y.,
U. S. America.

Dear Sirs: Re your ad in the "MoToR Boating" for July. I have a few gasoline automobile and motor boat engines which I desire to convert to using kerosene. I shall be glad, therefore, if you will send me particulars and prices of your kerosene carburetors. The engines are all 4 cyl. 4 cycle, horsepower from 12 to 24. Kindly address below.

Yours faithfully,

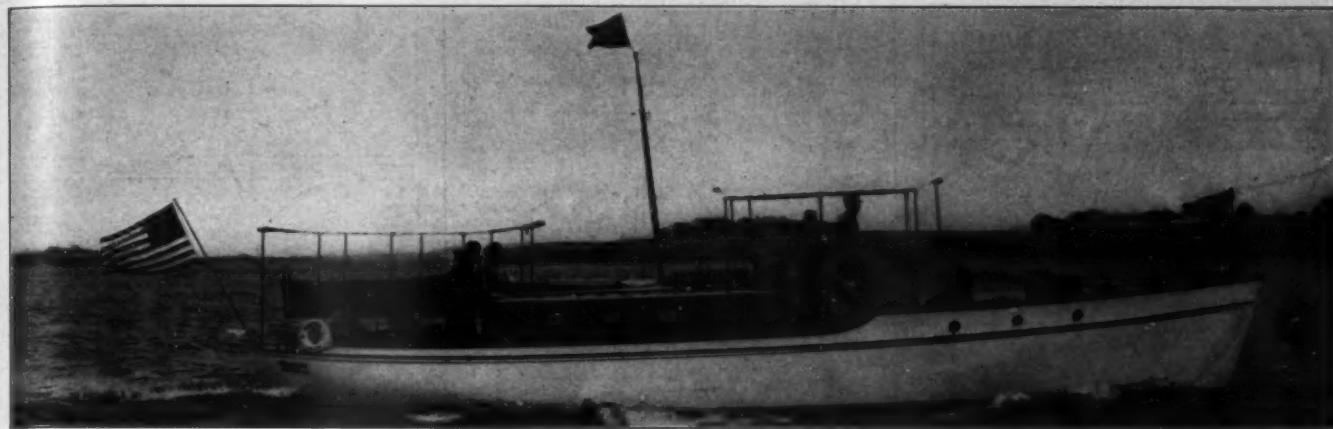
PINGHSIANG COLLIERY, (Signed) **WONG WEN PO.**
Transportation Office, Hanyang.

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**Opportunities
for the
Motor Boatman**

Before you buy or before you sell examine the exceptional buying and selling opportunities under this heading. They comprise the best offers of the month. Please mention MoToR BoatinG.



FOR SALE OR CHARTER—Exceptional opportunity to secure Lawley built bridge deck power yacht in absolutely perfect condition, ready for use, 48 ft. long, 10 ft. beam, beautifully finished throughout in mahogany, unusually comfortable saloon accommodating four persons, roomy crew's quarters forward. Standard motor. Speed 10 miles, separate generator. Luxuriously furnished. Has cruised extensively between Bar Harbor, Me., and Key West, Fla., and proved a splendid sea boat in roughest weather. Particularly desirable for Southern waters on account of extra deck room. Low figure for quick sale. Owner will consider 45 ft. speed boat as part payment. Inspected near Boston by applying to Boston Yacht Agency, 15 School St., Boston, Mass.



FOR SALE—35 ft. mahogany launch. Thoroughly equipped: Buffalo motor; speed 18 miles per hour. Splendid condition throughout. Excellent boat for Florida. Inspectable Detroit. Further particulars address Edward P. Farley Co., 80 East Jackson Blvd., Chicago, Ill.

FLORIDA Winter Cruising

Our lists embrace all the desirable Yachts available for sale or charter for use in Florida. Owing to our location and experience we are especially equipped to arrange satisfactory charters. We can provide Yachts for any period, long or short, from November Fifteenth to May First at very reasonable rates.

Our representative will be in Florida this Winter to look after the comfort of our clients. Let us know size of your party, length of time you will want a boat, and when and where you will want to go abroad.

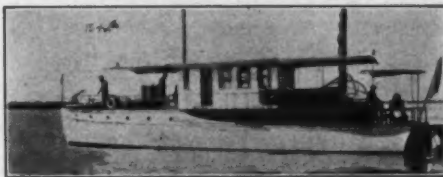
SOUTHERN YACHT AGENCY

American Building Baltimore, Md.

Ideal houseboat cruiser, built specially for Florida and Southern waters, located at Southern port, most comfortable, complete and roomy. Everything new; first class throughout; headroom 6 ft. 6 in.; every opening wire screened. Complete inventory; fine sea boat, 38 ft. x 10 ft. 6 in. x 2 ft. 6 in. Must be seen to be appreciated. Enclosed pilot house. All controls at wheel. Price low. Electric lights. Address General Engineering & Contracting Co., Charleston, S. C.

SEALED PROPOSALS will be opened by the Light-house Inspector, New Orleans, La., until 2 o'clock p.m. November 13, 1916, for the purchase of a gasoline motor boat of light draft, sixty to eighty feet long. Information upon application to the above office.

FOR SALE—45-65 H.P. 6-cylinder Sterling engine in good condition. Complete with reverse gear, magneto, batteries, and coils. Will take \$500 for this \$2000 outfit. Engine has a world of power and is good for many years of hard service. Address G. A. Neustadt, LaSalle, Ill.



No. 1342—For Sale or Charter—Roomy power cruiser of houseboat type; 60 x 12.8 x 3 ft. draught. Speed 11 miles; 40/50 H.P. 20th Century motor, new 1915. Accommodations include large saloon with two Pullman berths, one double and one single stateroom, bath and 2 toilets, galley, etc. Also deckhouse containing dining saloon. Probably best boat of type and size available for Florida use. In excellent condition. Price low. Cox & Stevens, 15 William Street, New York.

Speed boat, 18 x 3 ft. 8 in. Built 1916. High Speed 12 H.P. aluminum engine under hatch. Delco ignition. Seats four. Very fast. Must sacrifice. \$200. Hamilton Tobin, Vinton, Iowa.

SPEED-BOAT BUGS LOOK!

Having quit the racing game I offer for sale at about cost of scrapmetal: 1 6-cyl. 60 h.p. Pierce-Budd motor, 1 4-cyl. 40 h.p. Pierce-Budd motor, both complete ready to run. 1 20 ft. Hacker single step hull. 1 forward drive gear, 1 x 1.4 for 300 h.p. or less. All in good shape. Harry Godley, 616 W. 3rd St., Davenport, Iowa.

A VAN BLERCK AT LESS THAN HALF PRICE.

Will sacrifice \$1400, practically new, C-4 Van Blerck motor, 4-cyl., 3½ x 6¼—80 H.P. complete with Gray & Davis self-starter, only \$700. Motor run less than 300 miles and guaranteed in perfect condition and good as new. Now mounted on the block for shipping, testing or inspection. Photo and details on request. Box 371, Chicago, Ill.

I want to exchange my Brooklyn house, 3-story and basement, stone, for a cruiser to go South. Send particulars. 1391 Pacific St., Brooklyn, N. Y.

MOTORS.

Hundreds of fine motor values from one to six cylinders in all the most desirable sizes of the best high grade makes, at very low prices. Magnets, carburetors, timers, coils, axles, transmissions, steering gears and supplies of every nature. Send for big free list and state your requirements before buying. Badger Motor Company, Milwaukee, Wis.



BARGAIN—40 ft. x 10 ft. x 3 ft. 6 in. Cruiser 24-27 h.p. Standard motor. Electric lights, water supply, refrigerator, shipmate stove. Equipped and ready for cruising. In commission at Georgetown. Dr. H. M. Hucks, Georgetown, S. C.

AT A BARGAIN.

100 H. P. C-6 Van Blerck, unit power plant, absolute perfect condition, all copper jacketed manifold. Paragon gear, Bosch dual 2 point ignition, ideal for runabout or express cruiser. Care MoToR BoatinG.

A BARGAIN.

Practically like new V-Bottom Cruiser. New six-cylinder Van Blerck engine. Speed twenty miles. First-class condition throughout. Electric lights. Self-bailing cock pit. All controls at wheel. Full headroom centre of boat. Mahogany and enamel finish. Plate glass windshield. Cock pit awning and curtains new. Splendid sea boat. Full inventory. Location Southern port. Address General Engineering & Contracting Co., Charleston, S. C.

FOR SALE—Miller's yacht yard, 230 ft. water front. Two boat houses, one eighteen ft. wide and 100 ft. long, one fifteen ft. wide and 75 ft. long, two stories. Six sets of marine railways operated by power. 8 ft. of water at high tide. Good dwelling house. Up to date in every way. Good opportunity for right party. Terms reasonable. Address E. H. Miller's Yacht Yard, So. Norwalk, Conn.

WANTED—Second-hand runabout, 25 to 30 feet long, Albany, Elco or other standard make. Must be fully equipped and capable of 25 M.P.H. or better. Send full particulars and lowest cash price first letter. Address H, 608 Louisville Trust Building, Louisville, Ky.

WANTED—Cylinders for 1910 Model 5-Loew-Victor Engine. Or would take entire engine if price is low. J. F. Foster, Swansboro, N. C.

WANT to buy 35-foot Cabin Cruiser, not over 3 years old, with large deck space. Jas. L. Fritz, 940 Drexel Bldg., Philadelphia, Pa.

A reliable Power Outfit at a bargain—Am putting in a larger motor and will sell my present outfit for \$150.00. It consists of a 14 H.P. 2-cylinder, 2-cycle Lathrop motor with Paragon Reverse Gear, mounted on angle iron bed plate, Edison type coil, Magneto, two 25 gallon galvanized tanks, 24 in. 3-blade propeller with a short 1½ in. bronze shaft and flange coupling. C. F. McNeil, 82 Church St., New Haven, Conn.

WANTED—A first-class hull draftsman for yacht work. Gas Engine & Power Co. and Charles L. Seabury & Co., Consolidated, Morris Heights, New York City.

Trimount Whistle Blower Outfits

Blower runs by friction contact with engine flywheel. Whistle of brass, nickel-plated.

3 sizes, \$10, \$15, \$20.

Trimount Rotary Hand Bilge Pumps

All bronze composition. Suction lift 6 to 20 feet. A lifelong convenience.

3 sizes, \$20, \$25, \$35.

TRIMOUNT ROTARY POWER CO.

29 Heath Street

Boston, Mass.

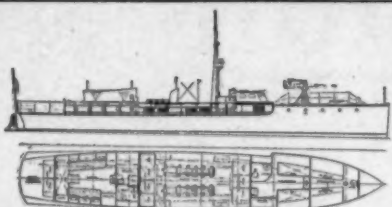
(Factory: Whiting Ave., East Dedham, Mass.)

Classified Interest—Plus!

THE December issue will have sufficient reader interest to warrant a reader keeping it for several months to come. As it will be practically a catalogue of the entire marine industry why not make it your catalogue of boats for sale.

When writing to advertisers please mention MOTOR BOATING, the National Magazine of Motor Boating.
Advertising Index will be found on page 58.

NAVAL ARCHITECTS & YACHT BROKERS



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73 ft. o.a. Speed, 30 Knots 11'8" Beam
BOWES & MOWER
Lafayette Bldg.
PHILADELPHIA
Express and Sea-Going Cruisers. Speed Guaranteed.

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HARRY W. SANFORD

YACHT BROKER

500 FIFTH AVE., at 42nd ST., N. Y.

High-class sail and power yachts for sale and charter. I shall be pleased to offer my services to those interested in purchase, sale or charter of any type of yacht.

Naval Architecture Marine Insurance
Tel. 6119 Bryant

Swasey, Raymond & Page, Inc.

Naval Architects and Designers
of the Better Class of Boats

100 Boylston St. Boston, Mass.

Rebuilt Engines backed by a strict Guarantee

Bruns, Kimball & Co., 115 Liberty Street, New York City, offer over 200 rebuilt engines, fully guaranteed, at exceptionally attractive prices. List will be sent free for the asking. Your present engine will be taken in part payment for a new Sterling, Kermath, Missouri, Harris, Eagle. Write for offer.

Cruising Along Florida's Coast

(Continued from page 11)

promises and then kept in a condition of practical slavery. Good hotel accommodations can be had at New Smyrna, and the hunting and fishing have made the place a favorite resort for sportsmen. There is a large middle ground in the river in front of New Smyrna. The best water is on the side nearest the town, and this channel will be reached if the beacons are properly followed from Mosquito Inlet. The water is so shallow on the middle bank that boats getting behind it cannot reach the dock.

From New Smyrna to Mosquito Lagoon the channel is rather hard to follow. It is of the same general character as that north of Matanzas Inlet, though the dredged parts can be recognized by the spoil banks. A good many beacons still stand in disused parts of the old natural creek and one should guard against being misled by them. At places where creeks cross the canal there are also likely to be small irregular shoals in the channel, and it is well to feel one's way over these spots with the lead. Near El Dora the going is particularly bad, and the headline should be freely used. South of El Dora a long cut will be entered which leads into Mosquito Lagoon.

On the eastern bank of this cut will be noticed the flagpole and notice board shown in one of the accompanying photographs. This flag is not to be used by yachts who get hung up on shoals, but is for the use of shipwrecked sailors who might get marooned on the beach, or by others who are in dire need of assistance.

Mosquito Lagoon itself is a large, shallow body of water, the deeper part lying, in general, along the western side. The Inside Passage runs down this lagoon for some nine miles and enters Haulover Canal, which gives access to the Indian River. The entrance to the Haulover from the Mosquito Lagoon side is crooked, but well marked, and no trouble will be had if the marks are taken in their proper order. The canal is short and deep, lying as it does through a ledge of rock. The town of Allenhurst lies on the banks of this canal; there are a store and inn here and the hunting and fishing are said to be excellent.

From the southwestern end of the Haulover a course should be laid for some packing houses which can be seen on the west bank of the Indian River. This group can be recognized by the large galvanized iron shed which is the most prominent thing in it, and after running this course for three or four miles a black beacon can be seen. This is rounded and the course described in the Pilot then laid for Titusville.

From Titusville to Grant's Farm the Indian River is a wide straight body of water with a depth in the channel varying from seven to ten feet. The river, like all wide shallow lakes and lagoons, can kick up a nasty sea during the northeasterly gales which at times sweep down it, and the excellent harbors offered by the creeks at Eau Gallie, Melbourne and Sebastian may be useful in case of a severe storm. Cocoa, lying between Titusville and Eau Gallie, is another attractive town on the part of the Indian River. Although it has no harbor, which will afford shelter from a storm, the place is a favorite point of call for cruisers. A bridge across the Indian River is to be built at Cocoa during the next year or so, but work has not yet been started.

Grant's Farm is a small island lying slightly out of the center of the Indian River. The channel lies to the west of the island and though it is well marked, care should be exercised in seeing that all the beacons marking the more distant shoals are observed.

South of Grant's Farm the channel lies down the center of the wide river to a place called Indian River Narrows, where, though the river retains a great width, the channel runs to the east of several islands which are close to the eastern bank of the river. All through the narrow a close lookout should be kept for beacons, and also for the overgrown spoil banks which enable one to tell a dredged cut from a creek of no importance. In this part of the river red beacon number 32A, which stood between black beacons numbers 27 and 29, had been knocked down in August. If the beacon is not in evidence, its stump should be observed; the latter was visible in August.

The channel out of the Narrows runs through a long dredged cut through a reef of rock and then wanders from the easterly side to the middle of the river. A careful lookout for beacons which are difficult to pick up should be kept through this part of the river. Where beacons occur in rows they mark a dredged cut whose spoil banks are not visible. Do not try to enter these cuts at an angle, but get square in front of them and go straight through, otherwise you are apt to get hung up on the end of a spoil bank which has been lengthened by the action of the current.

Indian River Inlet is passed before the town of Fort Pierce is reached, but the opening out to sea cannot be seen from the channel of the Indian River. Fort Pierce is a typical county seat, and is hardly worth stopping at unless supplies are needed. From Fort Pierce to Gilbert's Bar the river is of the same general character as it is north of Fort Pierce, but the shoals are less frequent and the channel deeper.

Jensen, which is passed a few miles before Gilbert's Bar is reached, is a good example of the little pineapple towns which abound along this stretch of the river. The pineapple fields and sheds can be easily seen on the sides of the long ridge of sand hills which run parallel to the river on its west bank.

After leaving the pineapple fields of Jensen one soon has his hands full getting across Gilbert's Bar. This is an artificial inlet which was cut with shovels about the year 1885, the present wide opening having been washed out by the St. Lucie River. The place has always been shallow, and has given much trouble to passing motor boats for many years. A great many changes in the channel have been made in order to find some location for the dredged cuts which will obviate the necessity of cleaning them out with a dredge at frequent intervals. The chart accompanying this article shows the latest location of the channel and should enable one to pass without difficulty. The dredged cuts are to be cleaned out before winter, but the dredge ranges set in August indicated that the position of the cuts is not to be changed. The canal from Great Pocket to Peck's Lake is to be widened. The channel up the St. Lucie is marked and further information about it can be obtained at Stewart. The fishing at Gilbert's Bar used to be excellent, but the effect of the dredging on this is problematical; the Government is deepening the channel out to sea at the Bar, and as the chart shows, work has been started but temporarily abandoned on account of the unsuitability of the dredge.

Hobe Sound is reached by a deep and well marked creek from the south end of Peck's Lake. A drawbridge crosses this creek just before the Sound is reached. Beyond the bridge lies the village of Hobe

(Continued on page 54)

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Cruising Along Florida's Coast

(Continued from page 52)

Sound. Fresh water can be obtained at the village dock, and some provisions and supplies can be had at the stores. There are an inn and a golf course on Jupiter Island. The inn can be reached by automobile from the village, or yachts can dock at the wharf of the Hobe Sound Yacht Club, which is near the inn on Jupiter Island. There is good fishing in some parts of the Sound at Conch Bar and in the Jupiter River.

Palm Beach is reached from Hobe Sound by going through Conch Bar, Jupiter Sound, Jupiter River, a long stretch of canal, and down Lake Worth to the town. The route is well marked, but the canal very shallow. It was said that the canal would be dredged before the opening of the tourist season, but at any rate it is passable for boats drawing three feet or less. Palm Beach itself lies on the east shore of Lake Worth, a short distance below Lake Worth Inlet. The place is too well known to need any description. West Palm Beach, across the lake from the resort, is a small busy town where supplies, water and repairs can be had.

From Palm Beach to Miami the passage lies largely through a series of canals and small lakes, some of which are annoyingly shallow, but passable to boats which can reach Palm Beach. The beacons on this stretch of the trip were to be renewed in September, and some new marks were probably put in then. The only directions which can be given in an article of this length are: go slowly, use your Pilot and your leadline. If, when in doubt, you go still more slowly, you will not get really hung up, although you may touch bottom.

From Fort Lauderdale, a small town north of Miami, it is possible to ascend the Everglades Drainage Canal to Lake Okechobee and then get from there to the Gulf of Mexico by way of the Caloosahatchie. The trip should only be attempted when the water in the lake is high, and inquiries should be made at Fort Lauderdale before the trip is commenced.

Miami, as has been said before, is the Mecca of the yachtsmen who spend their winters south. A big regatta for motor boats is held there in January, and the fishing is a continual attraction. Key West can be reached from Miami by a hundred-mile run along the Keys and the Florida Reef. There are two channels which can be used after Bahia Honda Harbor is reached. Both channels are described in the Pilot, and are shown on the large scale Government charts which can be obtained at Miami. From Key West the Gulf Coast is accessible to those willing to make a run outside, but that is another story.

Motor Boats Plan for Submarine Invasion

(Continued from page 9)

First Patrol Squadron was put in command of one of its members, Stuart Davis. Thereafter the Navy exercised only a supervisory control of the group, although it had the say in appointing the civilian skippers of the various vessels. In most cases the owners were chosen to command their craft, but the vacancies left by Skipper Davis in assuming charge of the squadron as a whole and by one or two absentees were filled with men who, in the opinion of the naval experts, had best qualified themselves for the task.

The work performed by this squadron was identical with that of the fast groups in other Naval Districts, consisting of discovering and "destroying" submarines and in protecting the battleship which had been assigned for this duty from attack by torpedo boat destroyers. Readers of Motor Boating are already familiar with the nature of this work, and it need only be said that here, as in every instance, it was performed with great efficiency to the sorrow (theoretically) of the naval units involved. So that the greatest number might benefit from the work of the motor boats, Admiral Knight appointed for duty on the P. S. boats several civilians who had been aboard Virginia undergoing the Naval Plattsburg training, and a few enlisted men were included in the roster of the most quiet fleet. All told, about fifty men took part in the maneuvers of this group, and each of these will receive from the Navy a certificate setting forth the work accomplished and commending him for it.

One of the vital factors contributing to the success of the Patrol Squadron was the mother ship Daraga, a 77-footer, owned by Commander Davis. Thanks to her, the squadron was self-reliant and self-supporting. Gasoline was furnished by the Navy, but if it had been desirable Daraga could have supplied fuel just as she was in a position to provide spare parts and other incidentals. The quartermaster was one of the most important personages of Daraga's crew, and he apportioned foods of all kinds to his charges—and made them sign a receipt, Bristol fashion, whenever they drew on him. Some of the members of the Second Patrol Squadron, which squadron was not provided with a mother ship, also found Daraga a friend in need, while the services of the surgeon, Dr. Ely, were in occasional demand for minor hurts by all concerned.

Daily fire drills were part of the routine work of the First Squadron, and the observance of general discipline was rigid. Much though all of us like our freedom, there are few who cannot enjoy the snap and precision which comes from obedience to prescribed rules and regulations. One effect of this discipline was that the squadron was ready at any hour of the night to jump from slumber to active service, for the boats were anchored in the fairway in squadron formation, and no man was allowed ashore except under written permission. In harbors boasting of docks belonging to the Navy, the boats were made fast, but here again orders were orders, and no member of the crews could step ashore without leave. And the men like this sort of thing. They were provided with a distinctive uniform which was in marked contrast to the mixed khaki clothing affected by members of other organizations, and it was a matter of pride with them to live up to their uniforms.

The squadron, which originally numbered five boats, now consists of nine, of which all are 40-footers with the exception of Nos. 6 and 8, 62 and 70 feet in length, owned respectively by Hermann Oelrichs and Harold A. Vanderbilt. No. 1 is owned by A. Loring Swasey; No. 2 by Stuart Davis (Skipper Orson D. Munn and Jack Rutherford alternating in command during the maneuver period); No. 3, Frederic Humphries; No. 4, Guy Norman (in charge of Charles A. Painter, Jr.); No. 5, Roland Nickerson; No. 7, Philip Hart; No. 9, Nathaniel Ayer. Each of the 40-footers is powered with a six-cylinder Sterling engine, No. 6 with two twelve-cylinder Van Blercks and No. 8 with two Sterlings. The whole squadron, with the exception of No. 9, was present for the en-

(Continued on page 56)

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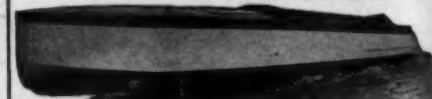
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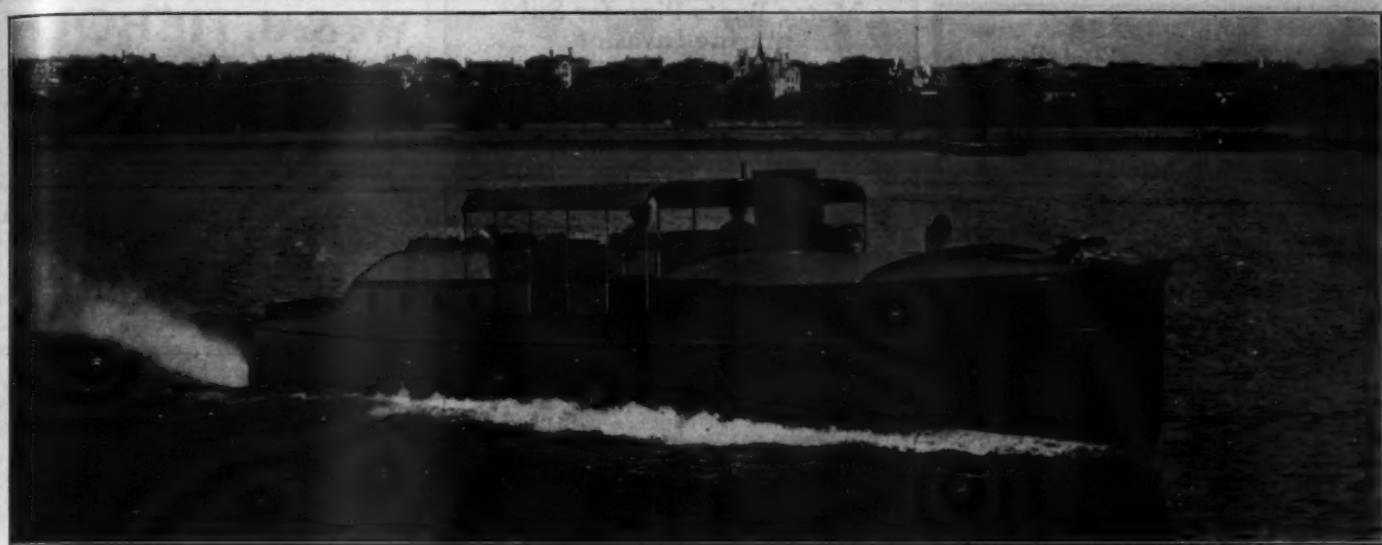
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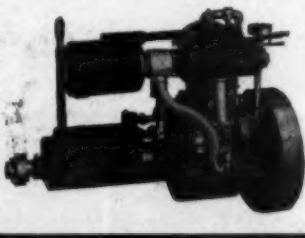
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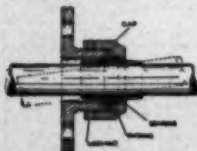
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Motor Boats Plan for Submarine Invasion

(Continued from page 54)

tire week of the naval operations, although the units of some of the other groups called it a job and knocked off after four days of work had been put in.

The members of this Patrol Squadron are duly enrolled in the motor boat auxiliary of the U. S. Navy, and all have pledged themselves to respond instantly in time of need. With their present equipment this would not be fully possible in winter weather, but plans are now under way for the construction of a new First Patrol Squadron which will consist of 60-footers capable of putting to sea in the middle of February and staying there for as long as there is work for them to do.

Above all else, the operations of these 40-footers have shown the paramount importance of having a mobile corps of motor boats, similar to those which are even now protecting the coasts and shipping of England from interference by hostile craft; and it is to be hoped that having made this beginning we shall not allow ourselves to be caught in a state of unpreparedness. The havoc recently wrought by a German submarine to Allied commerce almost within sight of our shores is an object lesson that could hardly be improved upon. If a foreign power declared war against us to-morrow, we should be in no better situation than the Allies now are in this new field of operations. But if we were able to supplement the work of our destroyers with that of a thousand swift scouts, capable of screening our battleships, of combating the seas for sub-surface intruders and of giving them effective battle on sight, then we could feel that the integrity of our coast and commerce was assured.

Let us hope, however, that the work of augmenting our mosquito fleets will not be left entirely to the patriotic impulses of private individuals. It is almost too much to expect of civilians that they furnish the boats as well as their training and their readiness to sacrifice life itself in the defense of our country. The initial steps toward the formation and subsidization of a large fleet of motor boat scouts should be one of the vital duties of the next Congress.

Practical Wireless for Motor Boats

(Continued from page 15)

may be either in the form of separate instruments or as complete receiving sets.

For use on larger craft the receiving apparatus should be of the better grade, an ideal set comprising a loose coupler, one or two variable condensers, a detector, telephone receivers and fixed condenser. To these may be added a variometer, although this last instrument, expensive as it is, need not be used if two variable condensers are employed.

In adjusting the crystal detector to its maximum sensitivity a so-called buzzer test should be used, although this is not an absolute necessity. The test consists of an electric buzzer of one type or other, preferably one especially designed for the purpose, although an ordinary buzzer will do, one cell of dry battery, a few feet of wire, and a push button. The buzzer is connected in circuit with the battery and push button in the usual manner, and a wire connecting with the ground lead or sending post of the receiving apparatus is brought to the contact post of the buzzer. When the push button of the buzzer test is depressed, there will be heard in the head receivers a buzz not unlike that of the usual wireless transmitter. The detector is then adjusted until the buzz is at its loudest, indicating maximum sensitivity of the receiving apparatus. In the more elaborate receiving sets a buzzer test forms an integral part of the equipment, hence it need not be arranged for by the purchaser.

The receiving range of a motor boat station can be materially increased by using some form of amplifier, which is inserted between the detector circuit and the telephone receivers. One form of amplifier which is now available for amateur use is claimed to amplify any signal from ten to twenty-five times its initial strength. Not only is it possible to read signals with greater ease when using an amplifier, but scores of signals which would otherwise not be heard can now be picked up and read with the aid of this auxiliary. The range of a set is still further increased by using a two-step amplifier, which intensifies the signals from twenty-five to one hundred times.

Of great help to the motor boat owner who contemplates installing a receiving set should be the complete and highly comprehensive catalogues issued by the manufacturers of radio apparatus, which are procurable for the asking. Not only can a selection be made from these catalogues, but the prospective buyer can secure the advice of the manufacturers with regard to his particular needs. Every maker of wireless apparatus is ready and only too glad to furnish a patron with complete data on the installation of the apparatus selected and its operation.

In installing the receiving apparatus aboard the motor boat it is well to see to it that the wiring is done with heavy rubber-insulated wire, because the salt air—in the case of salt water craft—has a tendency to cause leakage of receiving currents. Such leakage can ill be afforded, especially when it is remembered that the electric currents flowing through the apparatus are of infinitesimal volume. The apparatus should be installed in a dry place, and when not in use should be properly covered either by a wooden case or by a suitable waterproof cover not only for electrical considerations, but to protect the metal parts and to prevent the woodwork from warping. Particularly in the case of instruments made entirely of wood should these precautions be taken, since the wood is apt to gather moisture to the detriment of the set's efficiency. Instruments having panels of insulating composition or hard rubber, on which are mounted their components, are most suitable, perhaps, for marine use. But if the motor boat owner will only take the necessary precautions the all-wood sets will be found to serve satisfactorily.

The receiving apparatus should be either mounted on a table or arranged with a ledge or shelf in front of it on which the operator can write. The ideal arrangement would be one in which the apparatus is contained in a wooden chest mounted on a wall of the cabin, which is always closed except when the receiving station is in actual operation. The front of the chest is provided with stout hinges and chains so that it may be dropped down to form a shelf or ledge upon which the operator can rest his arms in taking down

(Continued on page 58)

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Rowboats and canoes for detachable motor. Motor boats and power canoes 16 ft. to 26 ft. constantly in stock. Longer lengths made to order.

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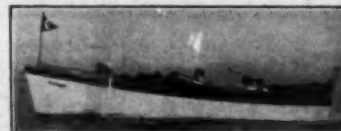
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Store your boat in a safe, handy to the city. Rates reasonable. Build and repairing by competent workmen. All work guaranteed.

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ENGINES,
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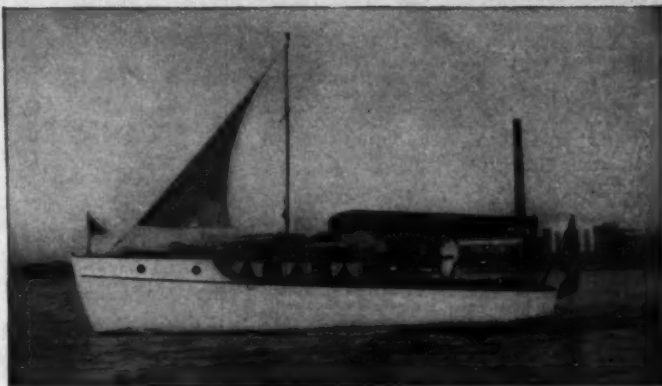
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This time it was first honors in the Long Distance Race of the Rhode Island Yacht Club. One hundred nautical miles on an ocean course that called for real navigating and real power. A sustained speed of seven knots for 14¼ hours, with the motor running steadily at 500 R.P.M. That is a typical Frisbie performance, whether in a hard race or in ordinary daily service.

"Frances E" is the boat, owned by Wm. T. Perkins of Providence. The engine is a three-cylinder 12-18 H.P. Frisbie and it turns a 24 x 24-inch three-blade Hyde propeller. "Frances E" is not a speed boat or a special racing creation but a good wholesome raised deck cruiser, built for comfort and reliability.

Another recent Frisbie victory is the first purse won by "Melloise," a big 55 ft. cruiser, in the Labor Day Race of the New York Athletic Club. Melloise is powered with a six-cylinder Frisbie motor.



"Frances E," winner of Rhode Island Yacht Club Long Distance Ocean Race, Owned by Wm. T. Perkins, of Providence. Three-cylinder, 12-18 H.P. Frisbie motor.

Gasoline



Kerosene

Frisbie Four-Cycle Valve-in-Head motors have established an enviable reputation for reliability, efficiency and economy. By locating the valves in the cylinder heads, we have secured an advantage of 20% greater efficiency and economy than in other motors of equal size.

Frisbie Kerosene Motors offer a combination of reliability and economy that boat owners and manufacturers have been seeking for years. Easy starting, smooth running, clean, quiet, odorless,—this is the coming type of motor.

Separate Manifolds for Gasoline and Kerosene

This is the only gasoline-kerosene motor having entirely separate manifolds. A manifold hot enough for kerosene causes a marked loss of power with gasoline, so two manifolds are the only possible solution.

The Frisbie Kerosene Motor can be run on either fuel singly, or on any combination of the two. It runs as well on gasoline as our regular gasoline motors. On kerosene the maximum power is just 4.76% less.

The kerosene is gasified so perfectly in this motor that there is no extra carbon trouble, and no smoke or odor in the exhaust. Special provision for lubrication overcomes all possibility of oiling troubles.

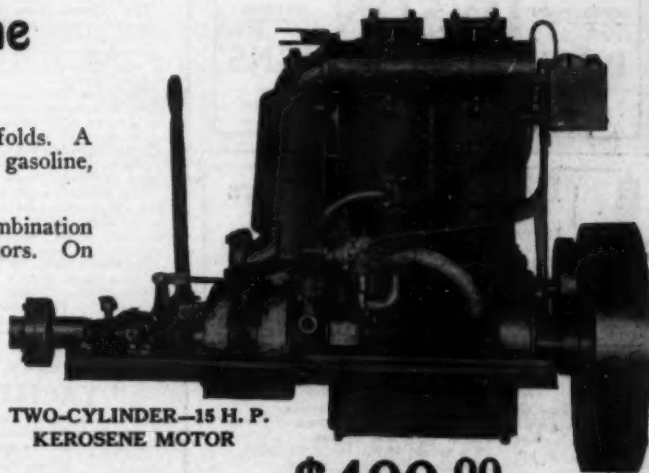
Compare the prices of gasoline and kerosene in your locality, figure how many gallons you use in a day, week, or a year, and then you can easily see how much a Frisbie Kerosene Motor will save you.

Write today for full information

Attractive Proposition for Dealers

The Frisbie Motor Co., Inc.,

7 College Street, Middletown, Conn.
Export Dept., 95 William St., New York



TWO-CYLINDER—15 H. P.
KEROSENE MOTOR

\$400.00

6" bore x 6" stroke, equipped with Atwater Kent Ignition, Paragon Reverse Gear, Mechanical Oilier, Etc. We can also furnish the same Kerosene Attachment for all other Frisbie models.



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Hear Uncle Sam's weather reports and exact time twice daily. Instructive, Educational and wonderfully interesting. Price is exceedingly low and no cost of maintenance. Send for our complete Electrical Encyclopedia No. 16, today, containing 275 pages, 658 illus's, 2000 articles, Morse, Continental and Navy Codes. Treatise on Wireless Telegraphy, besides valuable tables, formulas, and coupons for 20-lesson Free Wireless Course, etc. Encyclopedia sent free on receipt of 4c. to cover postage only. None sent otherwise. Book also lists complete line of electric novelties, flash lights, toys, sporting goods, lighting plants, motors, experimental apparatus, etc., etc. "IT'S THE LIVEST CATALOG IN AMERICA."

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Pneumatic cushions and mattresses for motor boats built to wear like iron and last indefinitely with ordinary care. The life preserver feature is a most important advantage. We also carry a complete line of leather covered "No Sink" KAPOC FLOOB CUSHIONS, CORK and PNEUMATIC GOODS for every purpose. Write today for catalog and prices.
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BEST IN THE WORLD.
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Dependable Fittings

Whistle outfits, Mufflers, Muffler Cut-outs, Filters, Fog bells, Stair locks, Combination flag pole and electric aft lights, Spark, throttle and reverse controls, etc.
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BRIDGEPORT

"THE MOTOR THAT MOTES"
Two-Cycle, Non-Backfiring Models.
Four-Cycle Heavy Duty Motors.
Kerosene or Gasoline Styles.
2 1/2 to 48 H.P.
Catalog Free.
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Preliminary sketches and estimates for yachts in any part of the United States supplied on request.
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OPEN ENCLOSED

Special No. 1.....\$15.00	Model E.....\$20.00
Model A.....24.00	Model F.....30.00
Model B.....42.00	

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45 East Fort Street
Detroit, Michigan

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Advertising Index will be found on page 38.

Practical Wireless for Motor Boats

(Continued from page 56)

the messages, while the apparatus is in front of him, within convenient reach. Especially on board a small craft where room is at a premium is this arrangement strongly to be recommended.

If it is one's intention to install transmitting apparatus either at the same time or at a subsequent date, due allowance should be made for the additional space required by the transmitter member of the station. The transmitter can also be placed in the wooden chest referred to, so as to group all the apparatus together.

So many factors enter into the matter of receiving range that any statement of distances which should be covered with certain combinations of apparatus are either very general or purely speculative. The reader should consider them as such. Here, however, is an actual instance of what can be expected from a modest receiving set on board a motor boat equipped with but a 20-foot aerial. A motor boat owner using a loose coupler receiving set recently reported having received the weather reports and press dispatches from the Arlington Government station when off Newport, R. I. This achievement is not exceptional; for even with such a small aerial any motor boat receiving set should operate over a range of some 100 to 500 miles, depending upon the merits of the apparatus used. With a larger aerial and the higher grade apparatus, the receiving range may be extended to upwards of 1,000 miles, which is common among the thousands of wireless amateurs throughout the country.

Yard and Shop

(Continued from page 37)

at Staats Point, Lamphere Dock, Four Mile Point, West Flats, and Con Hook, by providing brighter and flashing lights; increasing candlepower and providing fog bell at Jeffreys Hook; rebuilding decayed foundations and providing new towers and brighter lights at Bear Island, Cow Island, Nine Mile Tree, Roha Hook, Five Hook Island, New Baltimore, Fitch's Wharf, Percy Reach, Catskill West Flats, Livingston Creek, Upper Coal Beda, and Eoopus Island; rebuilding tower and fog-bell house and improving light at West Point, and establishing new lights at Van Vies Point, Barrytown Bluffs, Magazine Point, and Anthony's Nose, improving in all twenty existing lights and establishing four new lights.—From the Daily Consular and Trade Reports.

New McQuay-Norris Men on the Road

Ben R. Evans and Russell W. Long have joined the McQuay-Norris Mfg. Co.'s sales force as field men, traveling out of the St. Louis plant. Further increases in the sale of Leak-Proof piston rings are looked for as a result of their connection with the manufacturing company.

Trade Literature Received

C. L. Cummins, of Columbus, Ind., has sent us a booklet which describes Cummins' Universal devices for motor boats. These include the Cummins Universal shaft log and the Universal shaft coupling, both of which articles have been described in this magazine.

The Niagara Motor Boat Co., of North Tonawanda, N. Y., has just issued a new catalogue of Niagara tenders, runabouts, speed boats and cruisers. These are described in detail and are illustrated in half-tone, the catalogue being worthy of the fine grade of craft put out by this concern.

The Vichet Tool Co., of Cleveland, O., publishes a catalogue of the extensive line of high-grade tools manufactured by this firm. As price lists and illustrations are given the booklet should be of service to any boatman who is seeking needed tools for his equipment.

The Platt & Washburn Refining Co., of New York City, has favored us with a booklet which takes up in a very interesting way the practical lubrication of motors of all kinds, and points out the value of this concern's product, Vedol, in meeting oiling problems. The booklet is well illustrated and contains a great deal of valuable information.

The Great Lakes Boat Building Corp., of Milwaukee, Wis., has just received from the printers Bulletin 22, which takes up the Modified V-Bottom Military Type express cruiser which has been standardized as one of the line of Great Lakes craft. The description of this popular model is complete to the last detail and the interior and exterior photographic views of the boat show its many interesting features.

WICKER-KRAFT YACHT FURNITURE

Used on the finest boats. Regularly supplied by highest grade boat builders. Wicker-Kraft Chairs, fitted with life belts, are an original Wicker-Kraft idea.

Write for illustrated catalog.

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"COLUMBIA" Collapsible

Motor Boat Seat

OAK-PIANO FINISH

Price \$2.50

Complete Catalog "B" motor boat supplies mailed free.

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Guarantee Speed, Strength, Control. Catalog Free
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THE Arrow Two-Cylinder Outboard Motor

Has reversible propeller, enabling boat to run backward or forward as desired at any speed, up to and including ten miles per hour. Develops 4 h. p. Has Bosch double charging high tension magnets. Maxim silencer on exhaust. The Arrow Motor does not shake the boat. Can be swung up out of the water when desired.

Booklet upon request.

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LIQUID VENEER

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Motor Boat Polish

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A B L E ENGINE

The Wonder of 1916. A high class four cycle engine, simpler and lighter than any other ever built.

Four Cylinder, 18 H.P.

Without Reverse Gear, \$125; Weight, 150 Lbs.

Including Splitdorf Dixie Magneto, Carburetor and Spark Plug.

Eight Cylinder V-Type, 30 H.P.

Without Reverse Gear, \$230; Weight, 250 Lbs.

Including 3 Splitdorf Dixie Magneto, Carburetor and Spark Plug.

ABLE ENGINE CO., 405-42nd St. Bldg., New York City.



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Curtiss HIGH SPEED MOTORS AND FLYING BOATS

From 40 to 250 Horse Power
Speed up to 70 miles per hour
USED IN ALL PARTS OF THE WORLD
Write for Catalog
THE CURTISS AEROPLANE CO., BUFFALO, N. Y.

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Automatically Remove Carbon
50c and \$1.00 Trial Size 10c
From Your Dealer or Direct
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SMART and HUSKY

These words aptly describe the

GRAY "D-Jr."

A CLEAN, sensible design; strong, carefully selected material; expert workmanship and most thorough testing have produced in the Model "D-JR." GRAY a motor known round the globe as a powerful, dependable, efficient machine—one which may be relied upon on all occasions to deliver the goods. Cast integral with every motor is a quality found elsewhere only in the highest-priced Marine and Automobile engines, yet owing to our enormous output and splendid facilities the "D-JR." is low in price. It is every man's engine—the engine for you. With every GRAY "D-JR." you get a package full of pep, power and powder.

Note the strong healthy piston and connecting rod belonging to this motor. Do they not signify a long life of usefulness?

Note the huge powerful crank-shaft, $2\frac{1}{8}$ " in diameter, and the large bearing surfaces of this motor. We invite comparison of the diameter of these parts with those of any other motor of similar size on the market today. We believe in supplying our customers with a margin of safety which excludes all possibility of disaster, accident, or breakdowns.

Ask for the great GRAY catalog. Study the other merits of the "D-JR." and our other Models. Buy a GRAY and you buy motor contentment.

4 Cyl., 4 Cycle, Model D-Jr., 10-12 H. P., Bore 3", Stroke 4"
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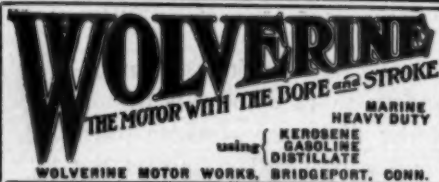


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Dimensions: 18
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high to top of
bowl; 2 1/2" cyl-
inder. For above
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line.

The best little closet on the market today, possessing many of the advantages of the large size toilet. All brass and porcelain. Oak seat and cover.

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For Sale by all Yacht, Boat and Canoe Supply Houses, Hardware and Sporting Goods Dealers
Send for Free Booklet "Marine Glue; What to use and how to use it"
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Never before has there been offered a complete outfit of this kind in wood poles, either maple or mahogany. Wires run through center of pole, and when in place in sockets all wires are concealed and waterproof.
Removable shade. When shade is in position no chance of water getting at wiring.
Costs less than the regulation stern light. Operates on one dry cell and complies with government requirements.
Fitted with 5-volt lamp
We can also supply 1 1/2-volt lamps

No.	Size	Maple Pole	Mahog. Pole
13	3 ft.	\$3.50	\$4.50
14	4 ft.	3.50	4.50
15	5 ft.	4.00	5.00

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Carleton Generator

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NO GASOLINE, NO DANGER, Maximum Power. Lightest Weight. Simple, Reliable, Economical. No batteries. Self ignition by Compression Fully guaranteed. Write for Catalogue M Crude, Fuel or Kerosene Oil.

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Our Special 15 ft. wide stern boat for outboard Motor is a wonder, safe and reliable, high sided and a fine rough water boat. Capacity, 6. Price, \$60.00. Bright seats, \$70.00. Order early.

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Motor Satisfaction

Come to every user of Watkins Special Motors. Especially fine for speed and light boats.
3 H. P., Single Cylinder \$55.00
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8 H. P., Four Cylinder \$140.00
Aluminum base, copper water-jackets, steel shaft, bronze bearings.

The Watkins Motor Co.
24 BAYWILLER ST., CINCINNATI, O.

Statement of the Ownership, Management, etc., required by the Act of Congress of August 24, 1912, of Motor Boating, published monthly at New York, N. Y., for Oct. 1, 1916.

State of New York, County of New York, ss. Before me, a Notary Public in and for the State and county aforesaid, personally appeared E. C. Wright, who, having been duly sworn according to law, deposes and says that he is the Business Manager of Motor Boating, and that the following is, to the best of his knowledge and belief, a true statement of the ownership and management of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 443, Postal Laws and Regulations, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business manager are: Publisher, International Magazine Company, 119 West 40th St., New York, N. Y.; Editor, C. F. Chapman, 119 West 40th St., New York, N. Y.; Managing Editor, C. F. Chapman, 119 West 40th St., New York, N. Y.; Business Manager, E. C. Wright, 119 West 40th St., New York, N. Y.

2. That the owners are: International Magazine Company, 119 West 40th St., New York, N. Y. Stockholders: W. R. Hearst, 137 Riverside Drive, New York, N. Y.; M. V. Hearst, 137 Riverside Drive, New York, N. Y.

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are: Columbia Trust Company, 60 Broadway, New York, N. Y.; M. V. Hearst, 137 Riverside Drive, New York, N. Y.; W. R. Hearst, 137 Riverside Drive, New York, N. Y.; Arthur Brisbane, 238 William St., New York, N. Y.; Lina Strauss, 27 West 72nd St., New York, N. Y.; George J. Gould, 165 Broadway, New York, N. Y.; E. H. Gary, 856 Fifth Ave., New York, N. Y.; Samuel Untermyer, 37 Wall St., New York, N. Y.; H. O. Shepard Company, Chicago, Ill.; George W. Perkins, 71 Broadway, New York, N. Y.; James Speyer, 1058 Fifth Ave., New York, N. Y.; Phelps Publishing Company, Springfield, Mass.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest, direct or indirect, in the said stock, bonds, or other securities than as so stated by him. (Signed) E. C. Wright, Business Manager.

Sworn to and subscribed before me this 30th day of September, 1916, S. B. Flaum, Notary Public, New York County. (My commission expires March 30, 1918.) (Seal.)

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Prest-O-Lite Dissolved Acetylene for Gas lighting and Engine priming.

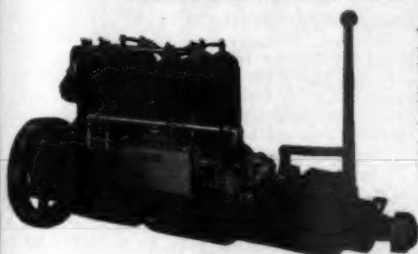
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Different Better Perfect

The entire bearing swivels in the arm.



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No bushings
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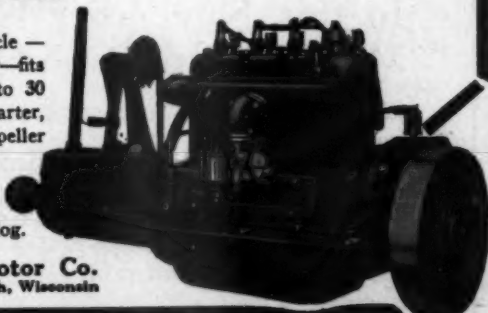
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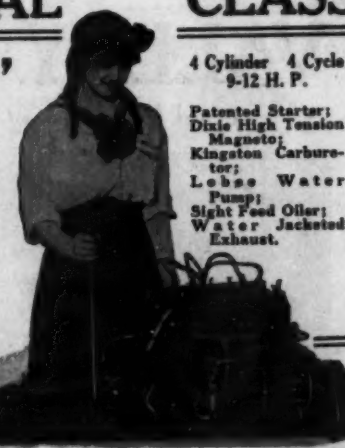
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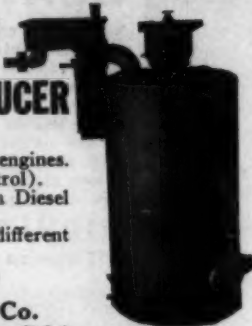
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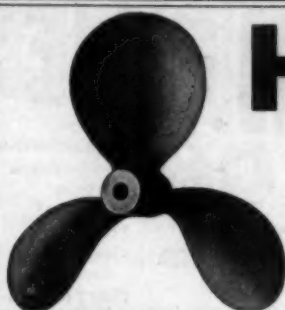
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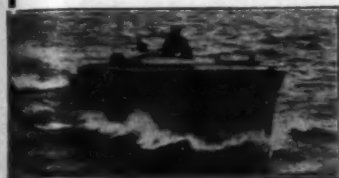
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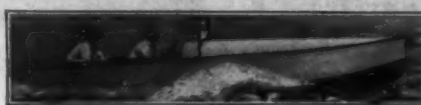
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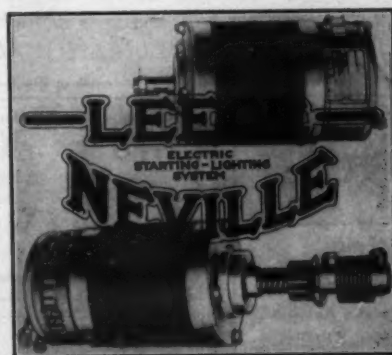
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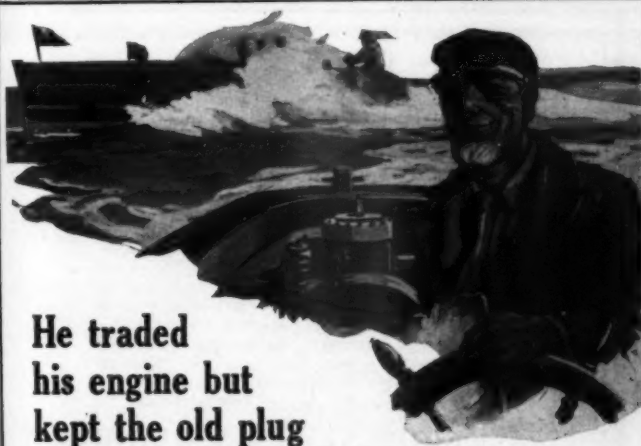
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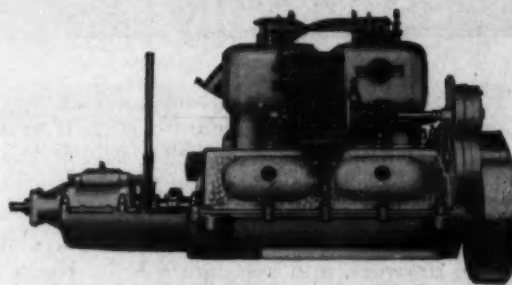
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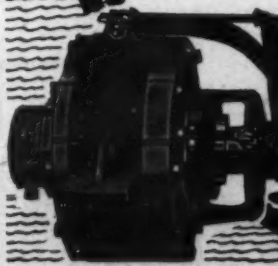
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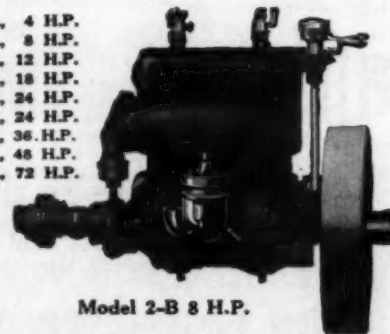
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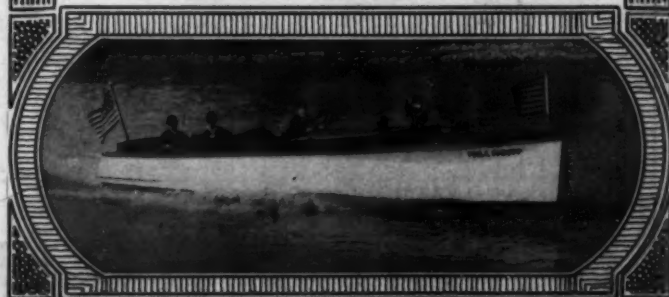
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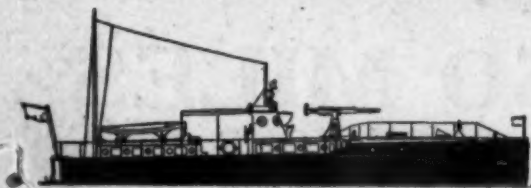
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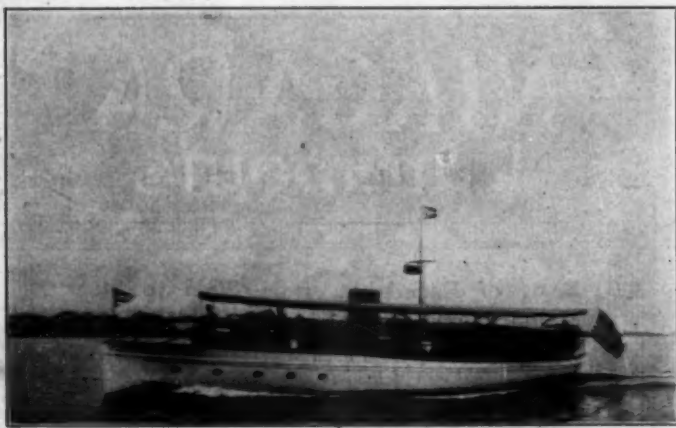
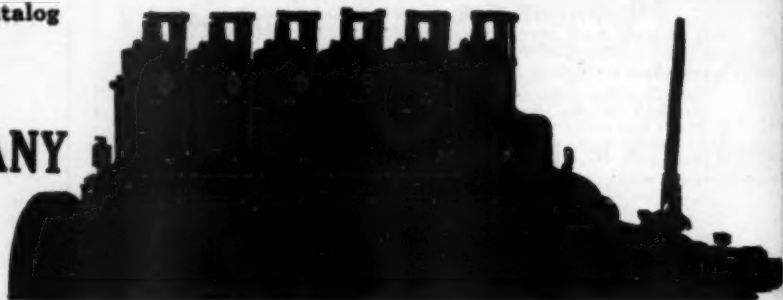


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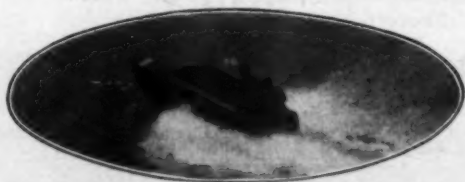
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If the oil supply fails, or is insufficient the engine stops, BUT—not until some necessary part or parts are ruined.

It is this vital importance of efficient lubrication which has steadily increased the demand for

Detroit Force Feed Oilers

The unvarying satisfaction given by the products of the Detroit Lubricator Company have made it the world's greatest manufacturer of lubricating devices.

Our booklet P 64 sent upon request.

DETROIT LUBRICATOR COMPANY
DETROIT, U. S. A.

Makers of Stewart Carburetors



Now building—nearly complete—a one-man control houseboat of this new type created by us.

This is your chance to get a 43-ft. houseboat

which offers a remarkable combination of moderate first-cost, low upkeep and economy in gasoline.

Mathis-quality throughout

An ideal comfortable boat equally at home in Florida waters or along any bay, river or shoal inlet.

Can be completed in a week or two. If you act quickly interior can be finished to your taste.

MATHIS YACHT BUILDING COMPANY
Cooper's Point Camden, New Jersey



One Coat This Fall

will preserve the wood—keep the under body in fine condition through the winter and give you a hard, smooth surface for a spring coat.

It is now all put up Double Strength for Topside

Semi-Enamel Yacht White and Gloss Black.

— Stearns-McKay —

Marblehead Anti-Fouling Green or White Bottom Paint

STEARNS-McKAY MFG. CO.
MARBLEHEAD, MASS., U. S. A.



VALVE-IN-HEAD
25-40 H. P.

\$460

\$550

Standard Type. Iron base and crank case, for heavy and medium duty work, speed 200 to 300 R.P.M.

High Speed Type. Aluminum base and crank case, for fast launches and hydroplanes, speed 200 to 1500 R.P.M.

Price includes Magneto, Joe's Reverse Gear and all usual motor equipment

To the undisputed Erd Quality we have added the undisputed superiority of Valve-in-Head design. And by producing these motors in the quantities warranted by the long standing Erd demand we have been able to reduce the manufacturing cost to a point which permits the exceptionally low prices quoted above. If exact figures were obtainable, we believe this particular Erd model would be found the most popular marine motor of its size and type on the market.

Tell us about your boat, what speed you want and let us submit a proposition that will interest you.

ERD MOTOR COMPANY
Saginaw, W. S., Michigan, U. S. A.



Makes Old Engines New

More engine dissatisfaction is caused—and more fuel wasted—by poor carburetion than by any other factor in motor service. Don't blame your engine if it isn't running as smoothly as it used to. Don't tackle an expensive rebuilding job or consider turning it in for a new model. Try a new carburetor first.

Gasolene today is a decidedly different fuel from that furnished three or four years ago. It requires an entirely different carburetor. Your present carburetor may be as good as new, but if it isn't an up-to-date design it can't give satisfaction.

Try a Kingston — at our risk.

THE Kingston "Enclosed" is a new type carburetor designed especially for the present low grade gasoline. It gives maximum power and revolutions with minimum fuel consumption. It will give you better motor service at less expense.

The Kingston is particularly adapted for marine use. There are no spring-controlled valves. Only one adjustment. Any novice can keep it in good adjustment.

Sold On Thirty Days Trial

Write us today for prices, trial offer and guarantee. You can try a Kingston on your engine and if it doesn't give satisfaction we will refund your money. You take no risks.

If you are getting a new engine, give it the best carburetion from the first—specify a Kingston.

BYRNE-KINGSTON & CO., KOKOMO, INDIANA, U.S.A.

New York: 1733 Broadway Los Angeles, Cal.: 501 W. Pico St. Chicago, Ill.: 1430 Michigan Ave.
Boston, Mass.: 111 Haverhill St. Detroit, Mich.: 870 Woodward Ave.

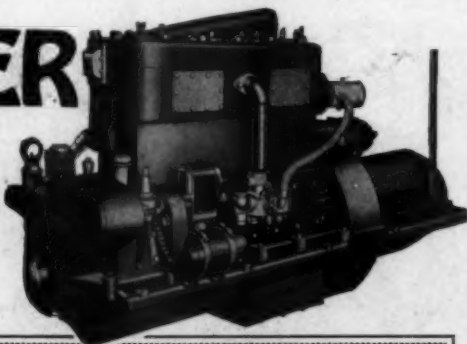
KINGSTON
"ENCLOSED TYPE"
CARBURETOR



MILLER

MARINE MOTORS

The Motor of Renown



FOR clean-cut quality examine the design of the Miller four-cycle engine shown above. You'll find the workmanship and materials equal in quality to the design. It is strictly high grade, and modern in every detail.

Simple, Durable, Economical, Efficient

Bosch magneto ignition and Bosch electric lighting and starting system. Furnished for burning kerosene, distillate or other low grade fuels, if so specified in order.

We manufacture the largest variety of four-cycle motors, covering fifteen different sizes and models, both medium and heavy duty, for the small runabout or the heavy sea-going cruiser.

Write for Catalog D.

Miller Portable Motor

with positive reversible propeller and variable speed. Bore 2 3/4", stroke 2 3/4", capacity 2 1/2 H.P., equipped with either Bosch or Dixie high tension magneto, also battery. Absolutely reliable and highly efficient.

Write for Folder R

MILLER GAS & VACUUM ENGINE CO.
2329-2331 North Talman Ave., Chicago, U.S.A.

Sole Agents for Australia: A. J. Dudgeon & Co., 9 Hamilton St., Sydney, N. S. W.

Consolidated Gas & Gasoline Engine Co., 282 Fulton St., N. Y. C.

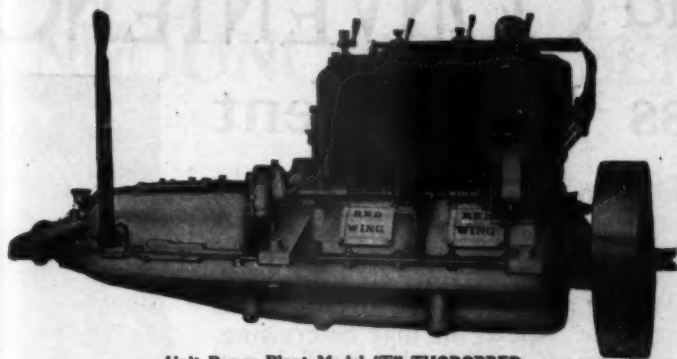


Racine^{Wis} Motor Boats

and cruisers are used by U. S. Government in Life-Saving and Lighthouse service, by foreign governments, by institutions and individuals everywhere. Racine^{Wis} is a name backed by twenty-one years of boat building skill. It means speed, power, comfort, safety and dependability in boats.

Write for catalog of speed and semi-speed family launches, motor boats, cruisers, rowboats and America's finest canoe—the Racine^{Wis}. Please mention your preference when writing.

Racine Boat Company
1615 Racine Ave. Racine, Wisconsin



Unit Power Plant Model "T" THOROBRED
28-36 H.P., 4 1/16 x 5"
Furnished with or without Unit Power Plant

Red Wing Thorobred
THE MOTOR WITH POWER TO SPARE

Why Boat Builders Make More

The Red Wing Thorobred has come to be known as the Boat Builders' engine, because it is installed and recommended by more builders of pleasure and work boats than any other single motor on the market.

The par excellence of every motor that leaves our plant, the universal satisfaction of Thorobred owners, the low quantity-production first cost, freedom from repair worries, low fuel consumption—together with our widespread national advertising are all factors which make it unusually profitable for the boat builders to install the Thorobred. And besides, every job turned out becomes a lasting advertisement for the builder who installs the Thorobred.

The Red Wing Thorobred is recognized all over the world as one of the best KEROSENE-BURNING MARINE ENGINES on the market.

**FIVE SIZES, RANGING FROM 14 TO 40 H.P.
PRICES RANGING FROM \$225 AND UP.**

We also build two-cycle engines from 3 H.P. up.

Write us today for further details

RED WING MOTOR COMPANY, Dept. B, Red Wing, Minn., U.S.A.

—be sure you get

McQUAY-NORRIS
LEAK-PROOF
PISTON RINGS

the
genuine



This angle-to-angle interlocking construction is the distinctive feature of the genuine Leak-Proof Ring. These two sections are of equal size and strength which gives the ring equal tensile strength all around, the only form of construction that makes this possible.

INVENTED and made exclusively by the McQuay-Norris Manufacturing Co. of St. Louis. The Leak-Proof design can not be copied—Leak-Proof service can not be duplicated—Leak-Proof durability can not be equalled by any other make of piston ring.

Send for FREE Booklet—"To Have and to Hold Power"—the standard hand-book on gas engine compression. It tells what McQuay-Norris Leak-Proof efficiency means. Write Dept. B.

Manufactured by

McQuay-Norris Mfg. Co., St. Louis, U. S. A.

Canadian Factory: W. H. Bantfield & Sons, 373 Pape Ave., Toronto

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New York
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The SAFETY and CONVENIENCE of Wireless Equipment



K.W. Transmitter

So many spectacular instances of life saving are credited to Wireless Telegraphy that its *convenience* for the motor boat owner has not received a just share of attention.

Think of the advantages of constant and easy communication with land and with other boats, no matter where one may be cruising. The business man can keep in constant touch with his office, can pick up news messages, receive weather and marine obstruction reports, naval observatory time, and no end of other valuable information. Wireless equipment quickly proves itself more nearly indispensable than a telephone on land.



K.W. Transmitter

The law provides that any radio shore station shall receive and transmit or forward over land lines at their regular rates to or from any ship station regardless of the system employed.

And in an emergency, such as may occur at any time, your wireless is ever ready to call for help from some radio-equipped ship that you will always find within easy calling distance.

Cutting & Washington Wireless Equipment has been especially designed for yacht use. It is simple, quiet, compact, reliable and easy to operate. This is not a toy, but a complete and powerful outfit, adequate to accomplish the class of work we have described. We have specialized in apparatus of this capacity.

COMPLETE EQUIPMENT READY FOR OPERATION, \$775.00 and up

Write today for full information.

Cutting & Washington

RADIO ENGINEERS AND MANUFACTURERS
26 Portland St.,
Cambridge, Mass.

DEFOREST WIRELESS EQUIPMENT



THE cut illustrates one of our receiving cabinets especially fitted for use on motor boats and yachts. It is **complete, compact**, and the **most efficient** set ever offered by any manufacturer for this purpose. Now used by prominent yacht owners with genuine satisfaction.

The U. S. and foreign navies use our receiving equipment extensively.

We offer also

WIRELESS TELEPHONES

requiring no special operator, for yachts. The owner can obtain good results. Invaluable for expedition of business, pleasure and in case of emergency.

Inquiries are solicited. Bulletins will be sent on request.

DE FOREST RADIO TELEPHONE & TELEGRAPH CO.
101 Park Avenue
New York, N. Y.

Makers of the Highest Grade Receiving Equipment in the World

Equip your boat with the best of fittings and do it economically

In cheap fittings, strength is usually sacrificed. Such goods are unreliable and short-lived.

Marine Hardware will give you long, economical and dependable service. It has been giving this kind of service since 1847. **anchors, wheels, deck-plates, compasses, steerers** and other marine hardware are standards.

SEND FOR OUR NEW BOOK—"Sea Craft Suggestions and Supplies," contains 112 pages and is full of good information. Just the compact reference book you need. Send 10c for your copy.

WILCOX, CRITTENDEN & CO., Inc.
Est. 1847. 4 So. Main Street, Middletown, Conn.
World's Largest Manufacturers of Marine Hardware
Manufacturers of the Famous Maxim Silencer for Motor Boats



Auto Boat Steerers

Strong and easy to operate. Steering posts of heavy brass, enclosed by an outer tubing which insures safety and convenience. S. & T. Controls are incorporated in the steerers, both controlling levers being conveniently placed inside the Wheel. Several styles. Write for literature.

The Mark of Quality



ANNOUNCING A SEMI-DIESEL ENGINE

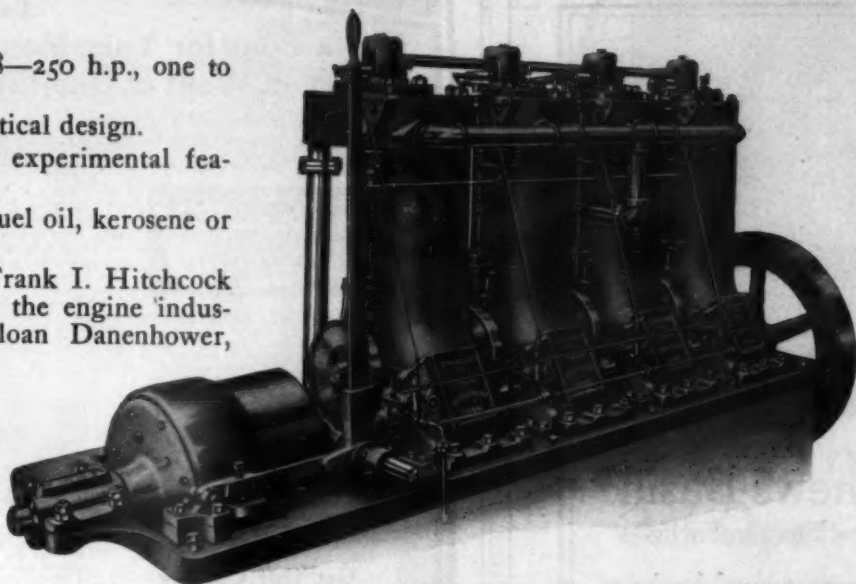
4-cycle, from 8—250 h.p., one to six cylinders.

A rugged, practical design.

Free from any experimental features.

Operating on fuel oil, kerosene or crude oil.

Designed by Frank I. Hitchcock (28 years in the engine industry), and Sloan Danenhower, late U. S. Navy (8 years' experience in U. S. Submarines).



You will be pleased with the reasonable price and extreme economy and simplicity of operation.

80-100 h.p., 4-cylinder, 4-cycle, 9x12 Standard Oil Engine; weight, 7500 lbs.

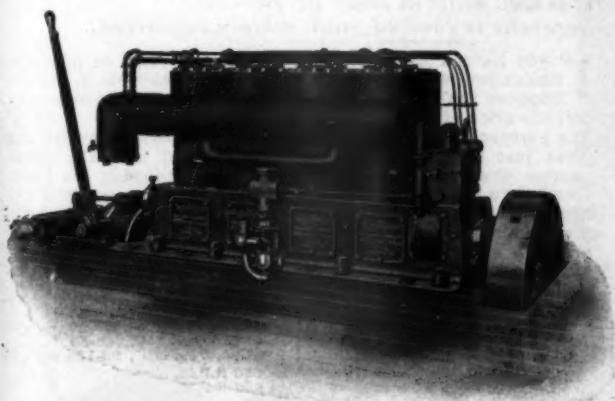
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STANDARD OIL ENGINE COMPANY

Works: Bridgeport, Conn.

Woolworth Building, New York City

"The Automatic"



HERE is a cruiser engine that is built to meet all demands—to give thorough satisfaction.

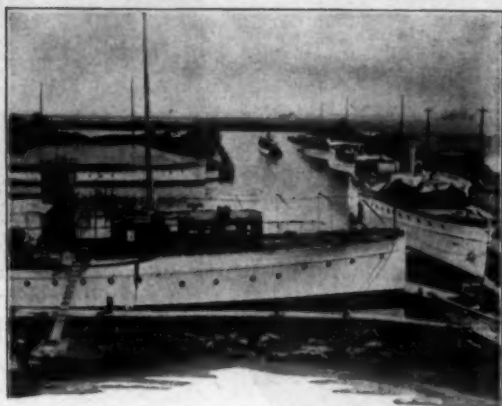
It is an accurate engine—every part made of selected material, capable of withstanding severe day-after-day service. This means economy in the long run.

It is an engine of advanced design and construction. It has removable and adjustable bronze bearings. It has an enclosed speed governor. It has a built-in lubricating system that is thoroughly dependable. Removable cylinder heads; large valves that may be taken out or reground without disturbing any adjustments; a combination intake and exhaust manifold that assures perfect combustion—even with very low grade fuel.

Among so many makes of marine engines, leadership is gained only by actual superiority. The *Automatic* maintains its leadership because of real merit. It is the engine that will give you permanent, efficient service—the engine that will last longer and cost less for upkeep. Catalog upon request.

The Automatic Machine Co., Bridgeport, Connecticut

ENGINE



The Matthews Basin

Scene of the Finest Storage Facilities

OUR perfect natural basin, unaffected by tides or storms—our electric lifting dock—isolation from the smoke and dirt of large cities—constant attention of experienced watchmen—and the services of one of the world's largest and best equipped power yacht building plants at your disposal for making any necessary repairs—all these help to make the home of

MATTHEWS CRAFT 

the ideal winter home for your power yacht or cruiser. We carry a complete stock of yacht equipment, castings and fittings of all kinds, as well as awnings, cushions and interior draperies on hand, so that every boat docking here for the Winter can be thoroughly prepared for early Spring use. Expert workmen are at your disposal.

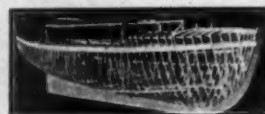
Send us the dimensions of your boat and we will send you our estimate for Winter storage and for any special service you require. If interested in a new boat, ask for literature, plans, etc. Write us today.

THE MATTHEWS BOAT COMPANY
602 Laurel Avenue Port Clinton, Ohio

BUILD YOUR OWN BOAT

**Twice As Big
a Boat for Your Money—or The
Boat You Want at One-Fifth the Cost**

If you have a fondness for creating something with your hands, here is your opportunity to indulge your hobby and employ your spare time both pleasantly and profitably.



DEFOE Knock-Down frames are set up complete at the factory before they are knocked down for shipment. Every part is fastened with screws and bolts, and we put on the top strake of planking and bore holes so that there is only one way to put it together and that is the right way.

If you want a boat—anything from a row-boat to a 65 ft. power yacht—build it from our knock-down frames and parts. You'll enjoy every minute of it, and later you will take more downright pleasure and pride in your own boat than in any boat you could buy.

We furnish knock-down frames, finished hulls, or complete boats equipped with power. The knock-down frames we sell are the same carefully fitted and finished frames that we put into the boats which we complete in our own factory. We do all the difficult and expert part of it—the rest is easy.



Thousands of successful boats and some of the best boats launched each year are built by amateurs on our knock-down plan. Even professional boat builders use our frames because they have found that with our wonderfully complete manufacturing equipment and experienced labor we can build frames better and more cheaply than the small builder himself.

Get Our Catalog

If you are a boat enthusiast you will enjoy reading every word of our big illustrated catalog. It contains photos, plans, dimensions, estimates, costs, prices and no end of valuable information. Don't fail to write for it today—FREE.

You can build this 50 ft. cruiser for less money than you would have to pay for the cheapest 25 ft. finished cruiser you could buy. You can build a 20 ft. launch for \$60, that would cost \$200. at a boat yard. We have patterns and frames for pleasure and commercial boats of all sizes and types from a canoe to a 65 ft. yacht.

DEFOE BOAT & MOTOR CO
3218 State St.
Bay City, Mich.

The WRIGHT Engine for Your Boat

because

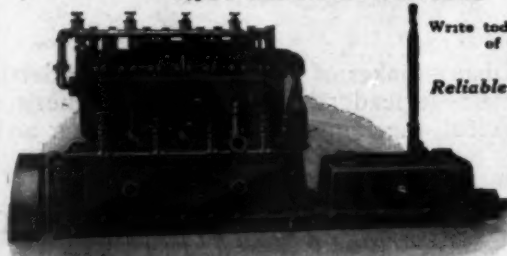
it uses cheap kerosene with very satisfactory results
it saves \$5.00 to \$7.00 a day on fuel—
it is well built in every detail—
kerosene is gasified—not merely vaporized.

IF you have a big boat, undoubtedly the price of gasoline makes you wince every time you have to take on a supply. Suppose you had a good kerosene engine, with kerosene at half the price of gasoline or less.

The kerosene equipment we use on Wright Heavy Duty Motors gives just as much power as gasoline, and uses the same number of gallons of fuel. By thoroughly gasifying the kerosene before it enters the cylinders we secure clean combustion, full power, and freedom from carbon and lubricating troubles. Wright engines have overhead valves, and are equipped with magnetic make and break ignition, using a Bosch Low Tension Magneto. The spark is advanced or retarded through the magneto, the same as a jump spark system.

3-Cyl. 6 x 7 1/4", 22-30 H.P.	6-Cyl. 6 x 7 1/4", 45-65 H.P.
3-Cyl. 7 1/4 x 9", 35-45 H.P.	6-Cyl. 7 1/4 x 9", 70-90 H.P.
4-Cyl. 6 x 7 1/4", 30-40 H.P.	8-Cyl. 6 x 7 1/4", 60-80 H.P.
4-Cyl. 7 1/4 x 9", 45-60 H.P.	8-Cyl. 7 1/4 x 9", 95-125 H.P.

6 x 7 1/4" runs from 400 to 550 R.P.M.
7 1/4 x 9" runs from 350 to 450 R.P.M.



Write today for full details
of this engine

Reliable Agents Wanted

**WRIGHT
MACHINE
COMPANY**
Owensboro
Ky.

Four Cylinder Kerosene Engine

When writing to advertisers please mention MOTOR BOATING, the National Magazine of Motor Boating.
Advertising Index will be found on page 38.

Berling sparks Patrol Fleet Flagship

IN the recent war game around the waters of New York, the Berling Magneto did its bit to "protect" the metropolis. All through the maneuvers, it sparked the Sterling engine on the Flagship "Chingachgook" which darted about the harbor, picking up mines, locating submarines and directing the activities of the rest of the "Mosquito Fleet."

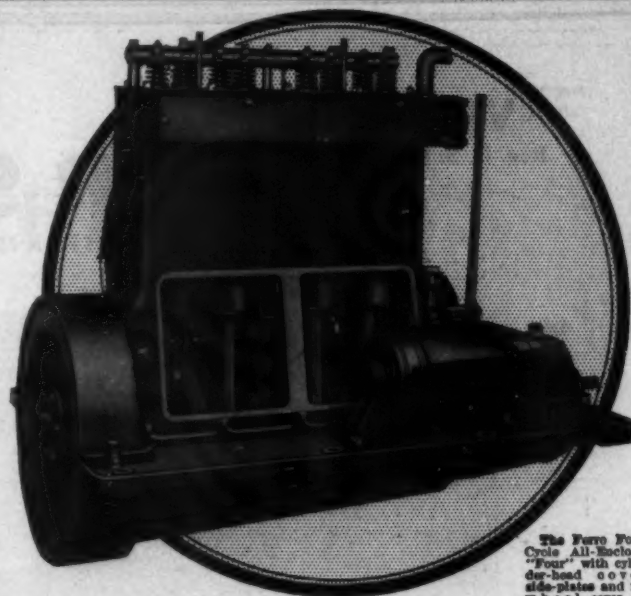
The

Berling Magneto

is sparking more and more of the best marine engines every day. It can be had for the asking on any good engine. Although it may cost the maker more, it costs *you* no more. The one-piece construction of the Berling makes it water-and-oil-proof.

Ask for the Berling.

Ericsson Manufacturing Company
1105-1145 Military Road
Buffalo, N. Y. U. S. A.



The Ferro Four-Cycle All-Enclosed "Four" with cylinder-head cover, side-plates and fly-wheel cover removed.

All Enclosed One Moment— All Open the Next

So long as it's at work, you want your engine protected from wave and weather, dust and dirt.

You want plenty of oil inside but none on the outside, to spoil its appearance and mar the beauty of your boat.

That's why the Ferro Four-Cycle "Four" and "Six," for medium duty, are all-enclosed.

But when need arises to get at the working parts, then there's great advantage in the engine that can be laid open in a hurry.

Such an engine is the Ferro Four-Cycle "Four" and the "Six."

Valves are located in the cylinder-head and have no cages. Quick access to them, to the removable cylinder-sleeves and the combustion chambers is provided by means of a detachable head.

Large hand-hole openings on the side of the engine—covered by easily removable plates—put pistons, connecting-rods, crank-shaft, cam-shaft and bearings within quick reach.

The flywheel, the reverse-gear—in short everything that might need attention—is easily accessible.

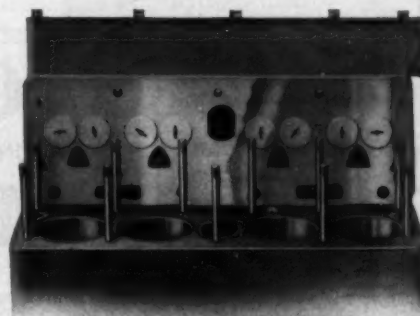
And accessibility is but one of a number of features that distinguish these engines. They're fully described in our literature. Write for it.

THE FERRO MACHINE & FOUNDRY COMPANY
1110 Hubbard Ave., Cleveland, Ohio.

Thirteen Other Ferro Models

These include a 10-H.P. Four-Cycle "Four," two-cycle models from 3 H.P. to 25 H.P. and the Ferro Rowboat motor.

Tell us which interests you.



Detachable Cylinder Head raised, showing how easy various parts can be reached.

MARINE ENGINES FERRO

VIPER
Reg. U. S. Pat. Off.

SEA SLED
Reg. U. S. Pat. Off.

VIPER SEA SLED

HICKMAN PATENTS



Latest Type Sea Sleds for Aviation Division, United States Army

Able, seaworthy boats, designed for rescue work in open water.

Length, 28 feet. Weight on trials, 7800 pounds.

Two six-cylinder 6" x 6" engines

GUARANTEED SPEED, 35 STATUTE MILES PER HOUR

Speed Shown on Official Trials, 43.54 Statute Miles Per Hour

Run from Gloucester to Boston, 28 miles, 18 miles of which is open water, in a stiff chop. Army officials aboard. Revolutions, 1200. Time, 48 minutes.

INCOMPARABLY THE FINEST SEA BOATS IN THE WORLD

MURRAY & TREGURTHA CO.

340 West First Street
South Boston, Mass.

THE VIPER CO., Ltd.

Pictou, Nova Scotia
Canada



OBERDORFER

BRONZE GEARED

PUMPS

BUSHINGS

FINISHED BRONZE



If Oberdorfer Pumps are good enough for standard equipment on
Loew-Victor Lockwood-Ash Morristown Scripps Erd
Fairbanks-Morse Red Wing Gray Lamb Smalley
and other well-built engines, aren't they good enough for you?

Our type "Z" pumps can be adjusted to relieve when any predetermined pressure is reached. The excess is by-passed within the pump; no return pipe is needed.

Write today for Pump Catalog

ENGINE MANUFACTURERS

Let us submit samples and quotations on Oberdorfer Bushings. They will save you time, trouble and money. Made of special bronze alloy, which is unexcelled in quality and durability.

M. L. OBERDORFER BRASS COMPANY
820 East Water Street, Syracuse, N. Y.

SUPPLYING THE SINEWS



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GASOLINE for a submarine must be of the highest quality. The dangerous undertaking of the undersea boat demands the best.

There is a very suggestive story in this illustration showing THAT GOOD GULF GASOLINE being delivered to the United States Submarine "D-1," at New London, Conn., preparative to its participation in the maneuvers of the Atlantic Squadron off the Massachusetts coast.

Gasoline good enough for submarine service is certainly good enough for you—and far better than others you can buy at the same price.

Put THAT GOOD GULF GASOLINE in your tank, and feel the exhilaration of **More Power** in your motor.

GULF REFINING COMPANY

The largest independent refining company in the world

GENERAL SALES OFFICES: PITTSBURGH, PA., U. S. A.

DISTRICT SALES OFFICES:

New York Philadelphia Boston Atlanta Tampa New Orleans Houston

Buyers' Reference

An Unusual Advertising Opportunity

THE December issue of MoToR BoatinG is the Annual Buyers' Reference and Export Number—the annual reference issue of the year. It is without question the most valuable issue of the year, both for the reader and the advertiser.

Every one who has anything to sell to motor boat owners, dealers, manufacturers or foreign buyers will find this special number the most profitable advertising investment of the season. Extra circulation, extra reader interest and extra attention as a volume for reference use throughout the year, insure a degree of value which warrants the use of maximum space by every advertiser.

These Are the Special Features

In addition to the regular editorial features and departments, this Annual Reference issue will have many special features.

Buyers' Reference Feature

December MoToR BoatinG will list or describe with profuse illustrations all the principal stock boats, motors, accessories, parts and other devices in the 1917 market—an invaluable catalog of the American marine industry. For instance, the specifications of each model of every motor manufacturer will be tabulated and arranged according to type and horsepower, so that the essential details are instantly accessible.

The buyer, architect or builder can refer to this section and at a glance see all the different makes of motors available for any one particular set of requirements. Manufacturers will then receive inquiries for catalogs and literature giving complete descriptions and information about the motors selected for investigation.

Articles on Trade Conditions

Special articles on the business side of the marine trade will appear in December MoToR BoatinG. The scarcity of raw materials and tools made it difficult for many manufacturers to meet the demands for prompt delivery this year. The prospects for improvement in this situation will be discussed.

The developments of the past season and the tendencies that affect future conditions will make it a valuable number for the business men of the industry.

Characteristic Boat Designs

December MoToR BoatinG will contain illustrations and descriptions showing the up-to-date designs of new motor boats and

yachts characteristic of all the prominent naval architects. These are designs which the architects themselves have selected at our request to represent their latest and best work. Many of them are for 1917 yachts, still to be built, and therefore contain the newest ideas for the various sizes and types of boats. This will include representative types propelled by kerosene and Diesel engines as well as gasoline.

This feature will be invaluable to buyers, architects and builders who want a comprehensive record of recent development and practice in marine design. It will be referred to constantly by thousands of persons who are planning and arranging new boats, reaching them at the time when they are most interested in the advertisements of various articles and accessories for equipment. Every advertiser will benefit by this extra attention.

The Marine Trade is Growing

The majority of marine manufacturers have done an excellent business during the past year. Present indications are that 1917 will be the most successful season ever enjoyed by this industry. Like the automobile industry, the marine trade must live and grow on a foundation of publicity, holding the attention and interest of its patrons against all counter-attractions.

MoToR BoatinG is the kind of magazine that benefits the trade it represents far beyond the returns and sales of individual advertisers. It is worthy of support on this basis alone, but it returns in actual value to each advertiser and reader many times more than it costs the individual or the industry.

Reserve Your Space at Once—Send Copy Early

ce & Export Number

Reaching All Classes of Readers

THE various editorial features of the Annual Buyers' Reference and Export issue have been planned so that this special issue will have special interest and value for readers of every class. The man who is building or merely refitting a little 15-footer, the builder, the architect, the motor and accessory manufacturer, the supply dealer or agent, the export buyer—to the man who orders a \$100,000.00 yacht—all will be reached by some of the special features of this great Annual.

Every man whose interest in boating, as a pastime, a sport or a business—whose interest is sufficient to make him read a special marine magazine—will have that interest intensified when he reads the December MoToR BoatinG. Such a number can only be published once a year—there is not enough material available for two such issues without repetition.

Special Export Value and Foreign Circulation

A rare opportunity awaits the marine industry in export business and foreign trade. World conditions were never more favorable to the American manufacturer for getting a valuable share of the world's trade. Arrangements being made by American financiers and large exporters in other lines open up an outlet for millions of dollars' worth of boats, engines and marine supplies of all kinds. An enormous export business has been transacted during the past twelve months, not only that which may be termed war business, but that flowing in regular channels as well.

Special Export Information

December MoToR BoatinG will contain an exhaustive article on the export marine trade and export opportunities, written by the best informed export authority in the country.

The writer of this article is a member of the Bureau of Commerce and Labor at Washington and has been in touch with every phase of the American export trade for many years, not merely in one line of trade or with one foreign country or one continent. Every facility afforded by a trained export organization, such as the American Consular Service, has contributed to the knowledge on which this article is based.

Extra Export Circulation

Besides our large regular export circulation, copies of this export issue will be placed in the reading rooms of ocean liners bringing buyers to this country from South America, England, France, Holland, Norway, Sweden, Italy, Australia, New Zealand, Japan, China and the Orient.

Copies of December MoToR BoatinG will also be placed in the hands of every American Consul and Commercial Attaché, the world over. The U. S. Government maintains a world-wide organization for the development of foreign trade. Its business agents are at the service of all American manufacturers. To have your advertisement in the files of each of these foreign representatives is one of the first essentials for the development of future export business.

Other Special Features

An article by a prominent manufacturer of stock boats.

An article by one of the foremost naval architects on the trend of motor boat design, with special reference to Express Cruisers and new features for next year.

MoToR BoatinG's annual review of racing.

An article about motor boats for war purposes.

An article on lubrication by an authority.

Copy and Designs Free

We shall be glad to write copy and prepare designs without charge for your advertisement in December MoToR BoatinG, if you have no advertising agency to do it for you.

Just send us catalog, circulars, photos or cuts at once and tell what space to use, also which points are to be featured. The copy will then be submitted for your approval before it is used.

For rates, further information or free copy service, write today to

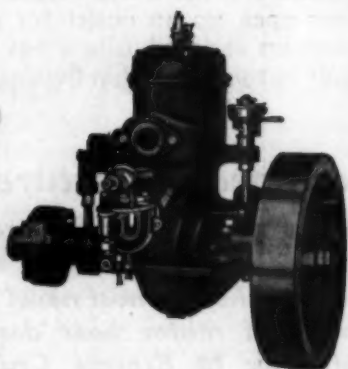
Advertising Department, MoToR BoatinG, 119 West 40th St., New York

EAGLE MARINE ENGINES

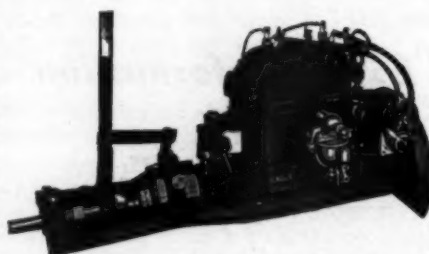
The popular priced line with excess power and excess value. You never had, and never will, purchase better value for your money than that offered you in every "EAGLE" Engine.

DO NOT PROCRASTINATE

1916 promises to demand more engines than there are facilities to produce. Manufacturers cannot purchase raw materials and deliver goods as promptly as in the past. There has been an evolution in business, resulting from enormous demands for all kinds of products, with the result that to go in the market today and attempt to secure supplies is almost impossible. Therefore, arrange for your engine requirements *early*, and be sure to arrange with a manufacturer who is likely to render you satisfactory service. You will find it more important than ever this year to use discrimination as to your source of supply.



It appears almost useless for us after 17 years of continuous national advertising and with a business record unsurpassed, to place our merits before you for consideration at this time, nevertheless there are a few of the better class dealers that we feel should be associated with us and selling the most complete and up-to-date line of 2-cycle engines on the market.



We have a large and varied line to choose from. Our popular-priced high-speed Models have no competition. They are in a class by themselves. They hold all records for speed and horsepower development and their construction is of surpassing quality.

Our Medium-Speed line of Engines is too well known to require any special mention. They have been a standard for 8 years, and the durability of this line is known all over the world, having shipped them to practically all foreign countries.

The Heavy Duty "EAGLE" Engine, for work boats and auxiliary purposes, cannot be improved upon. There are engines of this type in service that have been used continuously for 16 years, which is sufficient evidence of their value.

Therefore, we address ourselves to the live dealer, to the dealer who has an established business, who is sufficiently alert to grasp the importance of representing an established popular line and who realizes the importance and value of an association with an established house.

THE STANDARD CO., TORRINGTON, CONNECTICUT

PARAGON REVERSE GEARS

of this new yoke-operating mechanism are being rapidly adopted by marine boat builders who have extended their engine beds

THIS new model of the well-known Paragon has made an immediate appeal to engine builders who want to secure a compact installation. It is shorter than other models, and considerable room below the gear is saved by the elimination of any lower link. The operating mechanism rests upon and is attached directly to the engine bed. This results in an especially clean and compact installation and its stability greatly reduces any possible vibration.

Note especially the ingenious stop links, which securely lock the gear in position.

When you place your order for your new motor, you will probably wisely buy a unit power plant. A motor with this yoke-operating Paragon will give you a power plant in which you may always have implicit confidence.

Manufacturers Using PARAGON Reverse Gears

Anderson Engine Co.
Bridgeport Motor Co.
Buffalo Gasolene Motor Co.
Clay Engine Co.
H. C. Doman Co.
Fairbanks-Morse & Co.
Frisbie Motor Co.
Fulton Manufacturing Co.
Gray Motor Co.
Hall Gas Engine Co.
Hettinger Engine Co.
Holmes Motor Co.
Kermath Manufacturing Co.
Lamb Engine Co.
J. W. Lathrop Co.
Geo. Lawley & Son Corp.
Loane-Trask Engine Co.
Mason Machine Works
Mercury Motor Co.
Mianus Motor Works
Missouri Engine Co.
Red Wing Motor Co.
Regal Gasoline Engine Co.
Scripps Motor Co.
Sloane-Daniel Motor Co.
The Standard Co.
The Stanley Co.
Sterling Engine Co.
Teel Motor Co.
Van Blerck Motor Co.
Vim Motor Co.
Winton Engine Works
Wisconsin Motor Mfg. Co.
And Numerous Others

PARAGONS OFFER A WIDE CHOICE

There is a Paragon Gear for every size and type of motor. Nearly all the high-grade motor builders in the country are furnishing Paragons as a part of their regular equipment. The experience of these men who have studied marine transmission should be your guide on the gear question.

The Paragon enclosed type has been especially popular during the past year, and has marked another step in advance in reverse gear construction. Information regarding the Paragon Enclosed and other popular Paragon models will be gladly sent upon request.

PARAGON GEAR WORKS

Evans Stamping & Plating Co.
Cushman St., Taunton, Mass.



WINTON

The name "Winton" finds association with products of only the highest order.

So it has been for 20 years until the buying public has come to respect these products as representing the ultimate in their respective lines.

Obviously such a confidence will permit of no violation.

And we therefore repeat, that be it Gasoline or Oil Engine the performance of the required duty will be accomplished silently, easily and inexpensively.

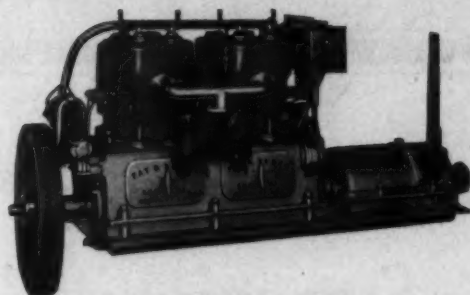
Orders for the coming season should be placed now

WINTON ENGINE WORKS
CLEVELAND, OHIO

"On the Square"



Here is a boat that is "on the square" — honest construction, honest comfort, honest speed and honest power. Certain satisfaction for her owner is insured by the reliability of her power plant—a



FAY & BOWEN ENGINE

Hillmont is a 35' x 6' 6" family runabout owned by Mr. George F. Armstrong, of Savannah, Ga. We emphasize her all-around honesty because she is the sensible kind of a boat we believe you have always wanted to own.

Not an unpleasantly speedy boat, nor, on the other hand, a commonplace slow boat, Hillmont is built primarily for comfort and safety,—ample in size and very substantially constructed.

The motor is a four-cylinder four-cycle Fay & Bowen, Model L-44, rated at 30-45 H.P. and equipped with electric starting and lighting system. The speed of 16 miles an hour is easily attained. Built by the Niagara Motor Boat Company of North Tonawanda, N. Y.

If you want a thoroughly GOOD engine, whether you prefer a two-cycle or four-cycle, you are safe in buying a Fay & Bowen. We also build complete power boats, independent electric lighting units, pumping sets, etc. "None Better Built."

Literature on request.

FAY & BOWEN ENGINE COMPANY

104 Lake St., Geneva, N. Y., U. S. A.

Made for Canada by the St. Lawrence Engine Co., Ltd., Brockville, Ont.



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KERMATH

"Structural Superiority"

Forgings used in Crank Shaft, Cam Shaft, Connecting Rods, Manifold Clamps, Hand Hole Plate Clamps, Clutch Dogs, Main Time Gear.

Solid bar steel stock used in Clutch, Main Shaft, Piston Pins, Tappets, Oil Pump Plungers.

Bronze Bushings used on all wearing surfaces such as tappet bushing, piston pin bushing, reverse gears, reverse gear pilot shaft, reverse gear main drive gear, water pump shaft.

Die-cast removable bearings used on all main bearings, connecting rod bearings, cam shaft bearings, cast under one ton pressure.

Manganese bronze and Tobin bronze shaft used in entire water pump and oil pump construction.

Nickel steel stems used in valves with grey iron heads fused on with oxy-acetylene process.

Vanadium steel wire used in construction of valve springs and oil pump springs.

40 to 50 point carbon steel used in reverse gears and step gears all cut and made in one solid

piece. Semi-steel castings used in fly wheel construction.

Flanged crank shaft used for fly wheel attachment with flange forged integral with shaft.

Nickel Steel used in connecting rod bolts and main bearing studs.

Manganese bronze used in clutch spider and reverse bands.

Malleable iron caps used on main bearings.

Steel rings cut from seamless tubing used between cylinders and manifolds.

Finest quality close grained grey iron used in cylinder and piston castings.

Five disc plates used in clutch construction.

Single piece base construction used carrying entire unit plant in absolutely perfect alignment.

Self-contained positive oiling system, lubricating not only the engine but entire plant, including reverse gear.

Entire outfit **Kermath-made, Kermath-inspected** in the **Kermath** plant.

It is often asked, why do Kermath engines, at their moderate prices, give such splendid service year after year and run so much better and so much more consistently than other engines?

You have the answer; it's noted above.

Then—there's another reason. When you stop and consider that we make only three sizes and that in these sizes in 4-cylinder, 4-cycle engines we probably make as many engines as any other four or five factories put together in this country, you can readily see why we can make them so much better.

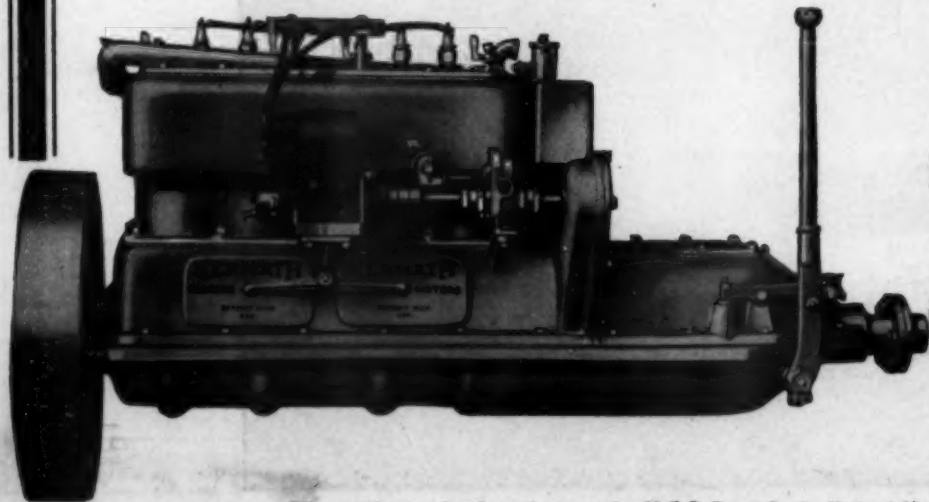
There is more time, more thought, more careful study put on these three engines than on any other three engines made today. And we have been doing this for a good many years. The Kermath is a natural result of intelligent concentration.

12-16-20 Horse Power - - \$195.00 to \$375.00

KERMATH MANUFACTURING CO.

Dept. 2

DETROIT, MICH.



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